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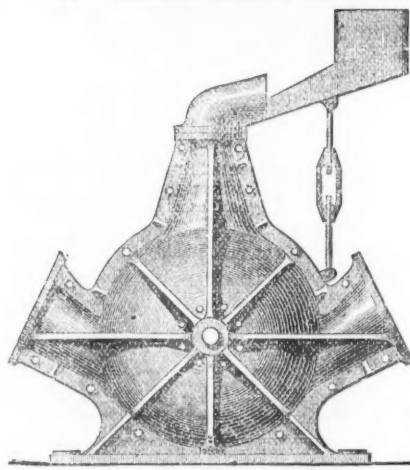


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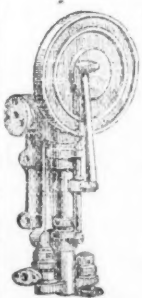
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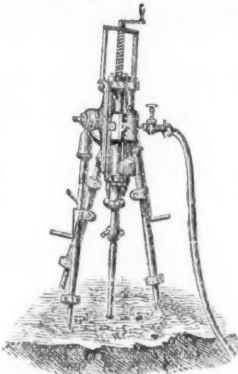
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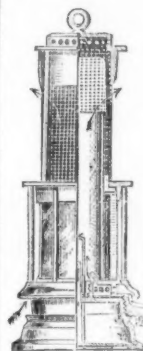
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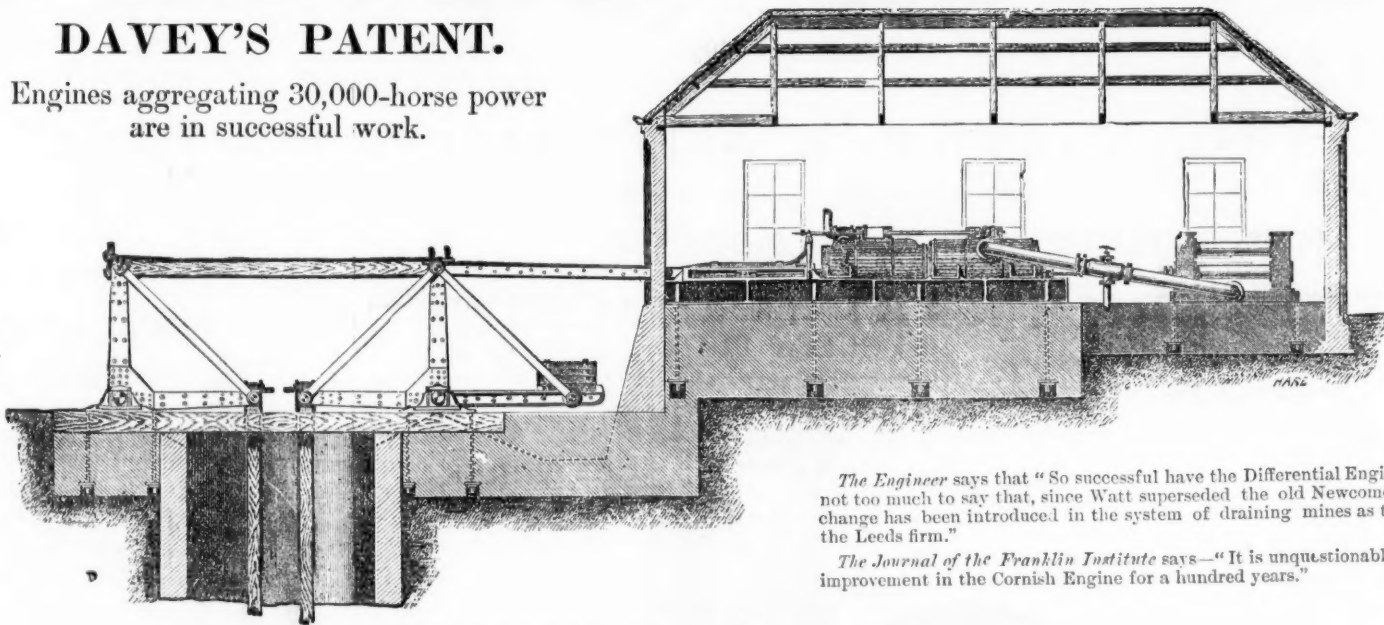
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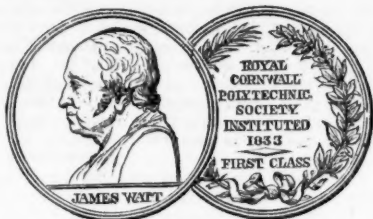
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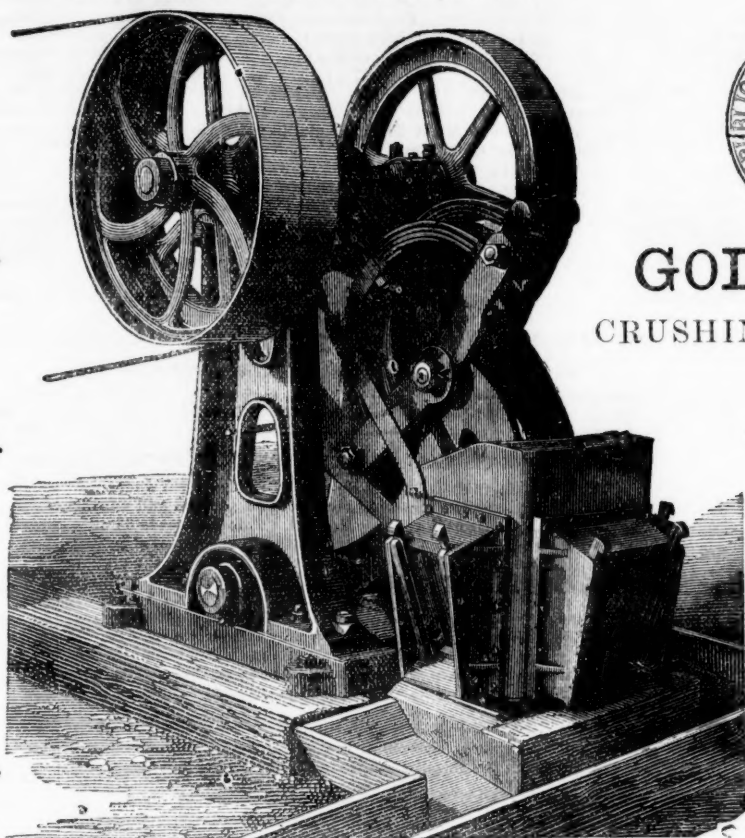
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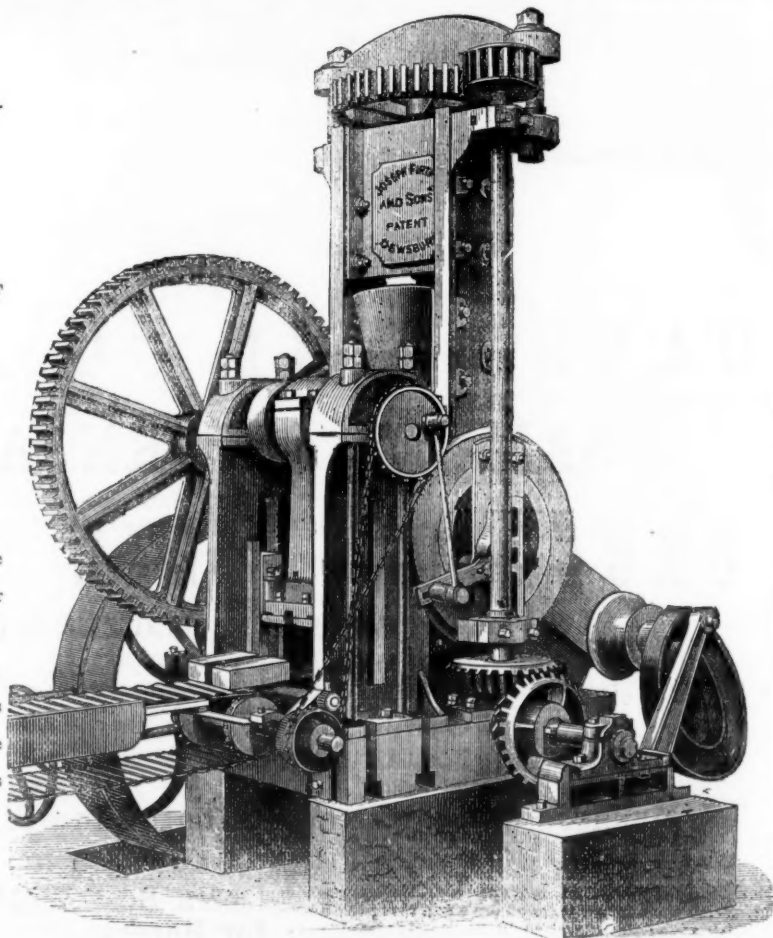
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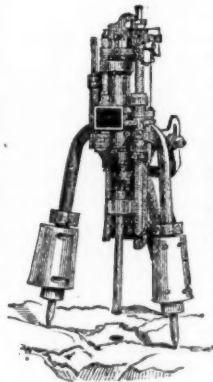
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GOLD PROSPECTING EXPEDITION TO THE WEST COAST OF AFRICA.—No. II.

By THOMAS CORNISH, Mining Engineer (late of Australia).
Author of "Gold Mining, its Results and its Requirements."

The soil in and around the town is a rich chocolate loam, overlying a reddish clay, mixed with quartz and ironstone gravel; in many places big quartz boulders and thin veins of quartz crop out of the surface, and gold can be found more or less by prospecting all about the town and beach. That good rich quartz reefs and alluvial wash dirt must exist in large quantities, and will be found when the dense forests skirting the town can be explored, there can be little doubt. The first prospect I saw of African gold washing, at Axim, was by three native women who were engaged to wash off some surface soil and sea sand from the beach. They use a large wooden dish, and are very expert in the work—in fact, I never saw any old mining prospect or pan off a dish of earth with such skill and dexterity. They use the same large wooden bowl or dish in which they mix their food, first scrubbing off the grease with sand. Having reduced the bulk they then use a smaller wooden dish, and finally clean off the gold with a sea shell. They appear to have no idea of saving the black sand or the magnetic iron which is so plentiful, but from their first washing I got them to save a small portion of the sand, from which I afterwards separated the magnetic iron to have each analysed, as I could see from the very fineness of the gold that it was impossible to save it all by the ordinary process of washing off by dish. The soil in both hills and valleys and sidings being much intermixed with ironstone gravel, the floods are constantly washing down the rivers, creeks, and gulleys from the ranges a continuous supply of fine gold with the fine black sand, and which gets thrown back on the beach in various places by the action of the waves. In some of the small bays or inlets, sheltered by rocks where an eddy is formed, will be found the best deposits of black sand, and where at times it may be gathered in large quantities, and if as I anticipate the bulk samples I am taking to England for assay prove favourable, a profitable business can be done by reducing the sand off the beach in many places by boulders, sluices, or other methods of washing, and exporting the black sand to England for final treatment for the extraction of the gold and other metals. The bulk of the free gold can be extracted on the spot by the ordinary appliances as used in Australia and California.

I have heard of some wonderful reports as to the richness of gold deposits and reefs in the Kong Mountains, where white men are not allowed to go. It is said of one king that he has a foot-stool or throne of an enormous nugget of gold. That the distribution of gold extends over an enormous area of country there can be no doubt, and it is only the means and time for exploration and development of gold mines when the Gold Coast of Africa may be made the new El Dorado. There will not be the advantages for the full development of individual mining labour in Africa as there has been in Australia or California. In those countries the land belonged to the several governments who were in a position to issue licences or rights to individuals to mine for gold, and the forests or bush country were easier of exploration than the African forests. Then, also, there was the advantage of civilisation and the means of living more in accordance with custom than can be the case here for some time to be obtained.

Climatic influences were also greatly in favour of Australia and California as to what the Gold Coast of Africa can be compared. Here it is too hot and close for white men to work, and it will be enough for them to do the skilled labour and supervise that of the natives, Kroomen or Coolies, that will have to be employed for the general working of mines. It is not my province to enter into a minute history of the Gold Coast of Africa, but having had the opportunity of perusing an old work on the subject I will make a few extracts and remarks therefrom. The work alluded to is entitled a "New and accurate description of the Coast of Guinea," divided into the Gold, the Slave, and the Ivory Coasts. Written originally in Dutch, by William Bosman, Chief Factor for the Dutch at the Castle of St. George d'Elmina, written in the year A.D. 1700. The writer appears to have received instructions to make himself acquainted with the history and resources of the Gold Coast and the country inland as much as possible; and considering the time and circumstances under which he was placed, and the difficulty of acquiring information, he has handed down a work containing much information of value to those interested in the production of gold and other products in West Africa. His first letter treats specially of the Gold Coast in general and the country of Axim in particular. He says—"This country called Axim is cultivated, and abounds with numerous large and beautiful villages, all extraordinary populous, some of which are situated on the seashore and others further on the main land, the most considerable amongst the former lie under the Brandenburgian and Dutch Forts, of which the latter is much the best. Our fort here is obliged for its present name of St. Anthony to the Portuguese who were its first masters, but, Anno 1612, were driven from this and several other places by our countrymen, and indeed the Portuguese served for setting dogs to spring the game, which as soon as they had done was seized by others. But to return to our fort, which was not great, but neatly and beautifully built as well as strong and conveniently situated, it is provided with three good batteries, besides breastworks, outworks, and high walls on the land side, as well as a sufficient quantity of guns, and if it were well stored with provisions might hold out against a strong army of natives. Guinea is a large country, extending several hundred miles, abounding with innumerable kingdoms and several commonwealths. The Gold Coast being a part of Guinea is extended about 60 miles, beginning with the Gold River three miles west of Assine, or 12 above Axim, and ending with the village Ponni, seven or eight miles east of Aera. The Negro inhabitants are generally very rich, driving a great trade with the Europeans for gold, which they chiefly vend to the English and Zealand interlopers, notwithstanding the severe penalty they incur thereby, for if we catch them their so bought goods are not only forfeited but a heavy fine is laid upon them. Not deterred I say by this, they all hope to escape, to effect which they bribe our slaves (who are set as watchers or spies over them) to let them pass by night, by which means we are hindered from having much one hundredth part of the gold of this land. And the plain reason why the natives run this risk of trading with the interlopers is that their goods are sometimes better than ours, and always to be had one-third part cheaper, whereby they are encouraged against the danger, very well knowing that a successful correspondence will soon enrich them."

It appears that for the past two centuries and more the Gold Coast of West Africa has been a great depot for the supply of gold, and for the most part of the time a bone of contention and warfare between various European nations, as also the native inhabitants of the country—but the means and methods by which the natives obtained their supply of the precious metal could only have been of the rudest and most primitive kind. That a large supply of gold must have been obtained from this coast there can be no doubt, as along the entire Gold Coast of about 300 miles forts were built and held by different nations for the purpose of trading, and getting when and where possible a monopoly of the gold trade.

The Dutch at about A.D. 1700 appears to have been the principal traders and factors on the coast, and to have held and built many of the chief forts. From the admissions of the author of the work I have quoted from they appear to have been adepts in the practice of cheating the natives in their dealings with them for gold. The Ankobra river is situated about two miles west of the town of Axim, and is a beautiful broad deep stream, so tortuous in its course that the Portuguese called it the Serpentine. It varies from 200 to 300 ft. in width past its mouth, the banks lined and shaded with trees, forest scrub and thick foliage, so dense that you cannot see many feet from the water. Many of the trees are overhanging with climbers growing from the branches down to the water, and are a great resort for monkeys and apes, and on the flats and mud banks are often to be seen alligators. From what can be seen by going up the Ankobra river there is nothing observable indicating auriferous country, and it is only by landing and exploring in-

land that the auriferous nature of the country can be seen. The Akankoo Gold Mine is situated about 10 miles direct from the mouth of the Ankobra river, but about 24 miles by the river; the mine is situated on its banks, and on the eastern side of the river is where I made my inspection of the quartz lodes, the principal of which and the one to which my attention was specially directed is situated on the top of a range about 150 ft. high; there is a bold outcrop of a well defined quartz lode about 4 ft. wide, incased between good foot and hanging walls, and from the general appearance of the stone should yield very fairly. The lode has an easterly underlay of about 50°, and was proved to continue about the same underlay by a shaft sunk 50 ft. deep on the sideing of the range, which not only proved the lode to be of the same good average width but also showing gold well. The lode is visible along the crown of the hill for some distance, and at the highest point shows a solid body of stone as an outcrop from 20 to 30 ft thick, reminding me very much of the Old Man Reef at Clunes and the big reef at Mount Egerton, Victoria, as I saw them in 1855; and from all I can see and judge from the general features and nature of the country, I cannot see why the results to be obtained from the future working of this lode may not be equally satisfactory and profitable to the owners as the ones I have mentioned in the golden Colony of Victoria.

The Akankoo Gold Mine being so favourably situated on the banks of a navigable river, and with prospects sufficient to warrant the legitimate development of the property, will in all probability be one of the first companies to be in regular work, and practically demonstrating the value of the West African gold fields. There are several other mining concessions or properties secured from the native chiefs on either bank of the river, but I am not aware that much work has been done on any to prove their value.

[To be continued in next week's Mining Journal.]

THE GRASS VALLEY MINES OF CALIFORNIA.

SIR,—There is, perhaps, no single district in the world where gold quartz mining has been prosecuted with such continued and unvarying success as in Grass Valley, California. This district is 65 miles north-east from Sacramento City, with which it is connected by railway. With an altitude of about 2300 ft. above the sea, the climate of the district is genial and salubrious, and mining operations can be carried on throughout the entire year. Leaving out of view the numerous placers of the district, which together have yielded upwards of \$200,000,000 in gold, the quartz mines by themselves have proved singularly productive. Since 1850, when the Original Empire was opened, these mines have produced upwards of \$50,000,000, the most productive veins having been those of the Original Empire, Massachusetts Hill, New York Hill, Gold Hill, Allison's Ranch, Pittsburgh, Rocky Bar, Providence, Eureka, and Idaho. Numerous other mines, though of lesser note, have yielded large outputs of bullion.

The peculiarity of this district lies in the uniformity and persistence of the veins. After 30 years more or less active working all these mines are as good, or nearly as good, as they ever were. They have but one obstacle to contend against, and that is water. The gold-bearing rocks are volcanic schists, slates, and greenstones. The quartz veins are not generally large, 2 ft. constituting a wide vein, whilst some of the most productive ones have not exceeded 1 ft. The gold is easily saved, being clean, angular, and not too fine; hence the proportion saved by the ordinary mill process is notably greater than in any other prominent locality. The sulphurets generally occur in the proportion of 2 per cent. of the gold-bearing rock; these are easily concentrated, and yield about \$100 per ton. The gold in the quartz yields, on the average, about \$25 to \$40 per ton. Rich chutes are often found in the veins, which pay from \$100 to \$10,000 per ton. The general average during any extended period of time is found to be about 1½ oz. of pure gold to the ton of quartz.

Labour and supplies are moderate in price, the cost of living being far less than in the City of London, and of mining supplies—such as tools, powder, candles, &c.—about the same. Fuel for making steam is dearer, the price of this material delivered at the mine being \$3 75c., or about 15s. sterling per cord. The country rock is covered by a thick alluvium, which absorbs the rainfall of the vicinity and drops it down into the adjacent strata. To pump this out of the excavations taxes the resources of the miners. It is a question of mechanical power. The water to be removed is plentiful, whilst fuel is scarce. If the quartz veins of Grass Valley were of uniform richness this question of mechanical power could be easily settled. It would only be necessary to devote a portion of the profits to a reserve fund for future working expenses and pumping. But their richness is not uniform. As a rule the gold accumulates in the largest quantities where the veins turn or change their direction. In the straight parts of the veins the gold is scarcer; although to this rule there are many exceptions. Even in these parts they generally contain enough gold to pay for exploration and extraction, though not always enough to cover the additional cost of pumping. Whenever the veins become unusually rich they are said to be in bonanza, and when a bonanza is struck the mines are worked with the greatest haste, and the profits divided among the stockholders with little thought of the future. In this way it sometimes happens that when what promises to become a bonanza is struck the management is without the means of proving it by exploration or extraction. To provide for such emergencies the more prudently managed mines keep a reserve of cash in the treasury. This is the case, for example, with the Idaho.

Says the New York Mining Record of April 30:—

The Idaho is situated within a stone's throw of the Pittsburg, both of them being within the town limits of Nevada City. The enclosing rocks and vein of the Idaho are of precisely the same character as the Pittsburg. The vein is of the same width, and contains the same average proportion of gold. Its development is subject to precisely the same conditions as the Pittsburg, except that, as it is now 500 ft. deeper, it costs more to hoist ore and pump water in the former than the latter. The Idaho was opened in 1869; it is now down over 1400 ft., and the levels are extended and stoped many hundred feet on each side of the shaft. Over 250,000 tons of quartz have been extracted from this mine. The vein has alternately been wide and narrow, rich and poor. Every vicissitude has befallen the management; all kinds of good and bad fortune have attended their labours. But from beginning to end they have kept a reserve when the mine was in bonanza, and expended it judiciously when the mine grew poor. What has been the result of this management? The Idaho has yielded some \$7,000,000 in bullion, it has paid 140 dividends aggregating some \$3,500,000, and it never has less than from \$30,000 to \$50,000 in the treasury for future work. It can be affirmed, without the least fear of contradiction, that these magnificent results are due entirely to good management.

The Pittsburg Mine was opened in 1851. The vein, consisting of white and bluish white quartz, both vitreous and saccharine, has averaged throughout about 15 in. to 18 in. in width, and \$20 to \$25 per ton in value. In places the vein has swollen to 4 ft.; in others it has dwindled to 6 in. At times the quartz yielded \$400 per ton, at others only \$7 or \$8. The average, however, has been as stated. About 50,000 tons of quartz have been taken from the mine, and it has yielded upwards of \$1,500,000 in bullion. The excavations have not been extended beyond 300 or 400 ft. on either side of the main shaft, which is now down to the 900 level on the incline. According to Prof. Hague the last time the mine was in bonanza, about the year 1872, it yielded \$239,000 in 23 months, all from high-grade ore. Since that time it has yielded \$228,000, chiefly from low-grade ore. A providential occurrence at the last moment was the finding of a rich ore chute in the vein on the seventh level, 300 ft. north of the main shaft, and tracing it down to the eighth and ninth levels to and past the shaft and up to the eighth level south. The vein holding this chute varies from 18 in. at the bottom of the shaft to 26 in. on the seventh level. So far as at present exposed it measures 400 by 200 by 2 ft., contains 12,308 tons of quartz, and is said to average \$75 per ton, though this seems high. This is a rich body of quartz, but rich as it is the owners are unable to take it out. The mine is rigged with an old Cornish pump, which consumes from four to five cords of wood a day, and barely keeps the mine dry to the sixth level. The seventh, eighth, and ninth levels are frequently submerged, and the miners driven out.

This description so graphically portrays the main features of the mine that there remains but little to add to it. The Record, however, has omitted to state that, according to the reports of Professors Huesch and Skidmore, the Pittsburg contains about 10,000 tons of ore in place of the upper levels. The main shaft was pumped dry down to the bottom, which is at a point where the 900 level is intended to be driven. The seventh and eighth levels were also pumped out, so that the newly discovered ore chute along those levels and in the shaft at the ninth level could be clearly traced, and it extends much farther and is of far greater dimensions than as stated by the Record. On the seventh level the ore body assayed from \$37.40 to \$132.01 per ton, and on the ninth level from \$15.22 to \$24.13. It should be stated, however, that on the ninth level scarcely more than the top of the ore body had been reached, not 30 or 40 ft. of it in a vertical direction having been laid bare at the period of inspection; 50 ft. lower down it will, doubtless, become much richer. Even as

it is the chute is very rich, for a general average of the entire body on the seventh, eighth, and ninth levels yielded \$30.11 to the ton. The general situation is that the Pittsburg Company has developed an ore body containing so far as at present determinable over 12,000 tons of quartz, averaging more than \$30 per ton, to say nothing of 10,000 tons of reserves on the upper levels, which being dammed up and water-logged could not be inspected, and that its means of keeping the mine dry enough to extract the ores and continue the exploration are inadequate. Confining attention to the new ore chute alone, there are at least \$350,000 in sight, which under the most unfavourable circumstances ought not to cost more than \$120,000 to extract and reduce, including the incidental cost of keeping the mine dry. Besides this there are the reserves on the upper levels certified to by Professors Huesch and Skidmore, and such additional extension of the new ore chute as further exploration may develop.

To lay as much ore bare as is now known to exist in the lower levels has taxed the resources of the management to the last degree of endurance. They had no cash reserve to assist them, and but for the system of assessments so unjustly condemned by inexperienced persons, they would have had to abandon the mine without coming upon the rich chute from which they will soon be enabled to reap an ample reward for their enterprise and sacrifice.

To earn this reward, however, they must be prepared to make one more sacrifice. It is useless to attempt to work this mine any further without a new pump. The waters dammed in on the upper levels may at any time break through the f.ail embankments that keep them back and drown the miners below. Even as it is, so much water finds its way below through the old stopes and numerous unseen passages that it has been difficult to keep the lower levels dry enough to make the recent development. There is only one remedy for this condition of affairs, and that is a new pump, to cost not less than \$20,000. The drain tunnel now being run from the ravine outside to the third level of the mine may assist to keep the three top levels dry, but it is not safe to depend too much upon this device. Even when a mine takes its water from the surface a good deal of water will find its way to the lower levels by lateral passages and crevices in the rocks, which no drain tunnel so near the surface will intercept and carry off.

With regard to other improvements, but a comparatively small outlay will be needed. The company have a good 10-stamp mill, the stamps weighing 650 lbs. each, and dropping 10 in. 80 times a minute. This mill has four pans and two concentrators, and is run by a miners' engine with 14-in. cylinder and 28-in. stroke, which burns about two cords of wood a day. Ten new stamps should be added to the mill at a cost (say) of \$10,000. The company have also a 15 by 7-in. Blake's ore crusher, an assay room, and furnace, and suitable buildings for the mill, hoisting works, superintendency, &c. The hoister has two 6-ft. drums, and a coil of about 1000 ft. of ¾-in. wire rope, and is run by a 12 by 24 engine. All these appurtenances are in good working order. The pump alone is inadequate to perform the work required, and must be replaced by a better one. For this purpose, and to provide enough working capital to run the mine until the first clean up is made at the mill, the company will need to raise at least \$50,000. In addition to this, \$50,000 should be reserved out of the first clean up as a fund to be kept in the treasury for future operations and explorations. Past experience in the management of this mine should be enough to convince the company of the advantage of adopting such a measure as a standing rule of action for the future.

San Francisco, July 21.

THE GOLD MINING ASSOCIATION OF CANADA.

SIR,—As a constant reader of your valuable Journal, and being to a certain extent acquainted with the subject under notice, I have been much interested in perusing the letters which from time to time have appeared in your columns relating to the above association. The letters of Mr. Higgins, one of your correspondents, evince an earnest anxiety to attain a knowledge of the true position of the company in which he has taken shares. In his last letter I observe that he asks a question of "Scrutator" (another of your correspondents) which the latter has not thought fit to answer, the question being, "What does 'Scrutator' know of Messrs. Chapleau and Humphrey, two of the directors of the company?" Judging by the somewhat authoritative manner in which "Scrutator" penned his remarks he would appear to be a rather "knowing" personage—at any rate, in his own estimation. His silence, therefore, is strange. Perhaps he does not know; otherwise his duty was plainly to reply to the direct query put by Mr. Higgins. I will endeavour to place a few points before Mr. Higgins, from which he will no doubt be able to form his own conclusion.

I will not revert to any lengthy comparison regarding the optimistic statements contained in the original prospectus published by the directors, amongst whom the Hon. J. A. Chapleau figures so prominently as a "local director." "Scrutator" has already very fairly done so, reading those sanguine statements in the light of subsequent events as officially recorded, and even Mr. Higgins must confess that results have hitherto been very disappointing. I have now lying upon my table a copy of that prospectus. I may be pardoned for referring to one or two paragraphs therein. On page 4 I read—"From the working of the black sand" immediate profits will be earned, and it is expected the mill for crushing the quartz will be in operation by the end of the year." The analysis of this black sand is given, showing 11 ozs. of gold to the ton. Again I read that "water is abundant."

I will now quote Mr. Higgins' question as contained in his communication appearing in the Journal dated June 11, Mr. Higgins desires information regarding "the unfittedness, incapacity, or other drawback of either of the above gentlemen" (Messrs. Chapleau and Humphrey). In respect to Mr. Chapleau, I can only say that from all the data I have been able to collate I have not yet discovered that he possesses the requisite knowledge which would justify one in forming a high opinion of his ability to successfully aid as a local director. Moreover a perusal of the Canadian newspapers informs me that Mr. Chapleau's time has been more than sufficiently occupied in controlling a rather turbulent provincial Parliament. The record of the Session just terminated shows several unpleasant passages of arms between the Government and the Opposition, in which Mr. Chapleau has not always appeared to advantage; on one occasion he narrowly escaped a vote of want of confidence. It is not, however, my province to submit in this place any detailed observations upon Mr. Chapleau's recent political career, I merely mention the subject to satisfy Mr. Higgins that Mr. Chapleau has had little opportunity to render assistance to the shareholders of the Gold Mining Association of Canada as a local director. In regard to Mr. Humphrey, his position is clearly defined in the prospectus already mentioned. He is there described as the "managing director, who has been conducting experiments on the property for the past two years." He may, therefore, be fairly considered responsible for the statements contained in that prospectus.

I should like to know what profits Mr. Humphrey has made from working the "black sand" (which was to be available for immediate profits) since the present company took possession of the property? Why has not Mr. Humphrey utilised the "abundant water" supply in washing the estimated "30,000,000 yards of gravel in sight carrying gold equal to \$9,000,000?" On May 11 last Mr. Humphrey despatched the following vague cable message to the directors—"Work on ditch well started; hope to commence hydraulic mining in July; prospecting lately with capital results." It is worthy of note that Mr. Humphrey merely hopes to commence hydraulic mining in July. The "abundant" supply of water, and the preparatory work of two years, ought to have placed the matter on a sounder foundation than mere hope. Has Mr. Humphrey commenced hydraulic mining yet? What are his results? Possibly he is still busily engaged in further prospecting, and therefore unable to devote attention to "hydraulic mining." Mr. Humphrey's prospecting seems a tedious affair in spite of his two years' work. I very much fear that poor Mr. Humphrey cannot report capital results in any department or his operations. He has sunk four shafts, which have in every instance touched clay on the bedrock. He has doubts whether he will be able to complete his water-course this year. Some of the men who took employment under him have left him. I think, Sir, I have encroached enough upon your space, and have said enough to enable Mr. Higgins to answer his own questions. I regret for Mr. Higgins' sake that the

information furnished by me is of so unfortunate a character. The fault does not rest with—
London, Aug. 10.

THE INDIAN GOLD COMPANY.

SIR.—So much interest is naturally taken in the East India Gold Mining Company's enterprises that I am prompted, from the sensible letter which appeared in last week's Journal from your correspondent Mr. Günther, to call your readers' recollection to the letter of Mr. Harman, a few weeks ago, to the effect that in respect to the Indian Gold Mines Company of Glasgow by far the most important question was whether the two tunnels which Mr. Severn proposed to drive into the face of the hill on the other side of that from the Alpha Company's Works had been begun, and if so if they had cut the lodes which they were intended to intersect at the depth stated, in order to test the value of the lodes, and to see if there were sufficient ore to keep the stamps going when erected and the mill lead finished. Mr. Günther very properly points out that before heavy expenses for machinery are incurred this important question of quantity and richness of the ore should be ascertained. Nothing has been said about this, and from what came out at the late trial with Mr. Harris it may be that the deeds of even their other great properties were not all sufficiently completed to justify their going to such expenditure, and consequently that Mr. Severn's time and attention have been given to the little Alpha property with the old machinery patched up. However, no such difficulties could have arisen with such companies as the South Indian, which are, I suppose, their own masters. How far have they proceeded with opening up their lodes, and have they been found valuable at depth? The works given up by the old miners do not prove that the mines are rich, perhaps. Some should say it should be just the opposite.—*Aug. 11.*

B. J. B.

SOUTH INDIAN MINES—NUNDYDROOG GOLD MINING COMPANY.

SIR.—It must be as disappointing to the general body of shareholders as it is to myself to be kept in ignorance at a critical period of our mining operations of our prospects so far as circumstances allow a judgment to be formed. The most recent date included in the accounts which have been handed to us is May 2, when visible gold was reported as having been met with in more than one quarter, and general appearances were represented as highly encouraging. At the statutory meeting held on March 5 last a promise was given by the Chairman that shareholders should be duly informed, and with the least possible delay, of what is going forward at the mine from time to time. When Capt. Plummer wrote on May 2 he was on the point of dispatching several samples of ores collected in the course of working, for the purpose of their being submitted to a London assay. Whether the result was satisfactory or otherwise remains to be known, no public announcement having been made, and shareholders are naturally anxious to learn whether the yield was at all answerable to expectations. As a cautious miner Captain Plummer refrained from committing himself to any estimate of value; but in his letter he reminded the board that the lodes from which the specimens were obtained were of great width, and easily worked. Much, no doubt, must be left to the discretion of the board in their communications with the shareholders, so as to avoid on the one hand exciting false hopes, and on the other producing needless alarm; but the sudden and prolonged discontinuance of information can only have an injurious effect, and in that view of it cannot be considered as a judicious proceeding. As a general rule a liberal policy is the wisest and safest to adopt.

Indian mines have not yet acquired such an established reputation as to be beyond the influence of public criticism; on the contrary, they have a difficult future before them, which will task the best energies and the most scientific methods of treatment by those entrusted with the development of their resources before the success prophesied of them is likely to be realised.

It is readily admitted that a few isolated specimens must count for little towards determining the exact character and capabilities of a mine—the only safe test of value being the average produce of the ore raised by a patient and systematic working. Until, however, this latter stage is reached it would be unfair to deny to shareholders the satisfaction arising from less reliable evidences if they are the means of keeping alive their confidence and interest in the adventure.—*Aug. 9.*

A SHAREHOLDER.

MINING IN SOUTH AUSTRALIA.

SIR.—My communications to you have been very infrequent of late owing to the continued depression in the English copper market, affecting unfavourably the mining industry in this colony. The recent purchase of the Burra Mine by English capitalists, and the formation of a large company to work the Blinman, Yudanamutana, Mount Rose, and other great mines north of Port Augusta, promises to give a fresh impetus to copper mining here. It would be well if English capitalists and others interested in mining were fully aware of the vast variety as well as extent of our mineral deposits. If the conditions were more favourable for working our iron ores we have that metal in greater abundance, if possible, even than copper. We have immense deposits of limestone, but unfortunately no coal at present. There are, however, rumours of two or three discoveries of very favourable indications of the existence of coal. I happen to know that these reports are not without foundation, and the work of sinking is going on in at least two localities, from one of which I have myself seen small pieces of fairly good coal raised. The boring for petroleum near the Coorong is still proceeding. A vast bed of brown shale, 68 ft. in thickness, has been bored through, and below that hard sandstone, with occasional fossils, has been struck. The total depth at present is about 333 feet. Other localities are being tried for coal within 12 miles of Adelaide, in the neighbourhood of Port Pine and elsewhere. Geologists assert that we shall never find coal in South Australia, but we have in the Antipodean regions found even scientists occasionally at fault.

I have for some months past devoted a considerable amount of time and labour to urge on the public notice here the extent and richness of our gold deposits, and am glad to see at last the fruit of my exertions beginning to show itself. It has in some respects been unfortunate for South Australia that we have had no extensive alluvial gold fields, nor any reefs worked with sufficient skill and perseverance to yield continuous and remunerative returns. We have, however, had opened two or three alluvial fields of limited extent; but which have afforded, nevertheless, excellent returns for a number of years to several hundreds of steady panning diggers. For instance, a fact was lately published that an old German, who had worked for many years on the Echunga diggings, and who was always thought to be in a state of miserable poverty, lately took his passage home in one of the Orient Company's splendid steamers, taking with him as the result of his gold digging 12,000*l.* Another case is that of a canny Scotch farmer, who off a very few acres of his land—less than five I believe—obtained 1200*l.* worth of gold. This included 600*l.* worth from a small roughly sunk shaft, about 50 ft. deep, containing a not very well defined quartz leader, from 1 in. to 3 in. in thickness. I have inspected the place, and fetched away fine samples of the gold in quartz. In other localities there are well-authenticated instances of farmers, in a quiet and almost perfunctory manner, washing several hundreds of pounds worth of gold from the surface soil, and with it buying the fee simple of the land which they were renting.

Within the last week the public have waked up to the importance of our gold deposits, and two or three companies have been floated. There seems some little danger of a "gold fever" or mania setting in, and unfortunately there are always speculators ready to take advantage of anything of the kind, and encourage it for their own benefit rather than for the general good. When once the gold fever seizes the public they seem to lose all self-restraint, and are ready to invest money recklessly in any company that offers, and when the bubbles burst legitimate mining enterprise suffers a serious check.

Our gold-bearing country is now known to extend over an area of about 250 miles from south to north, and for at least 30 miles from west to east. Several new and important discoveries have been made lately, and stand a fair chance of being proved shortly. It is

the opinion of many practical men that we shall find our richest gold deposits at a considerable depth, as is the case in Victoria. There is also a movement on foot to work our galena and silver mines, which are of considerable value. I hope soon to be able to report satisfactory progress.—*Adelaide, Aug. 1.*

J. B. AUSTIN.

DON PEDRO NORTH DEL REY MINING COMPANY.

SIR.—The application by the directors of this company to the shareholders for more money raises the question—"That, however good the mine may be, are the present directors the proper persons to have the administration?" It must be recollected that under their management, and from want of practical knowledge of mining and the resources of the country, the 60 ft. iron wheel was ordered, which has caused a loss of at least 35,000*l.*, when a 1000*l.* wooden wheel would have served all purposes infinitely better. Anyone can manage a prosperous mine, because the *laches* are not noticed, and the talk is of the actual dividends, and not what might have been paid under good management. A case in point is that of a neighbouring mine, where the inefficient and extravagant management has, it is believed, beaten the mine. The mine was so good that it took a long time to do it; but they at last would seem to have succeeded, and are now endeavouring by unfairly forcing to keep up the produce to hide the errors committed, but, as I believe, will ultimately fail. The managing director of the Don Pedro states that when he went to the mine he knocked off expenses to the tune of 800*l.* per month, or 9600*l.* per annum (about the amount of the debenture debt), without decreasing the efficiency of the mine service. This would show that the amount raised on debentures has been imprudently expended, and a debt for interest at 30 per cent. created of 4600*l.* Can anything be more culpable or prove more clearly the inefficiency of the board than this appears to do? For the directors to confess this, and then ask the shareholders to pay the bonds with interest at the rate of 30 per cent., and to effect this to issue new shares to rank only with the old shares, shows a poverty of financial resource which does not warrant the retention of office by the present directors, and they should be induced to resign to more capable men. How can they expect shareholders to pay 20*s.* for shares to rank with shares hardly saleable at 10*s.*? What we want is a new company to buy the old one upon equitable terms.

In Brazil the surface management could not be in more efficient hands than at present, although Mr. Heilburth is so inadequately remunerated for his services; while in Capt. Martin the company have a most zealous employee with a thorough knowledge of the mine. I see the General in the chair takes great credit for not appropriating fees. I beg to congratulate him, and to thank the board for this favour; a greater boon, however, would be their resignation.

Rio de Janeiro, July 10.

A SHAREHOLDER.

NEW CALLAO—VENEZUELA.

SIR.—The shareholders will be sorry to hear of the death of their captain, from sunstroke. This is a great misfortune, as Mr. Robotham was a thoroughly experienced miner, and his greatest ambition was to prove his oft-repeated opinion that our mine would turn out a second El Callao. Mr. Skertchley has consented to go out and erect the machinery, which left London by the cargo-boat on the 6th inst. *Northallerton, Aug. 8.*

A SHAREHOLDER.

EUREKA (NEVADA) MINING DISTRICT.

SIR.—I have the pleasure to hand you my usual budget of news from this locality:—

Men who have millions in mines, and who have been all over the Black Hills, and seen everything in Utah, Colorado, and Arizona, not long since told a Reno reporter that Eastern Nevada was the best mining country in America; that it was the most highly mineralised, and had the best ledges of any district yet discovered. They say the country is not half prospected, and that they have every faith of a grand future.

Prof. W. P. Jenney, who arrived here from the East on Tuesday evening, left yesterday morning for Secret Canyon, for the purpose of making an examination of the Geddes and Bertrand mining property.

Eight men are working and prospecting over in Coleman District, near Cottonwood Park. A party from Ruby Hill are said to have found something very encouraging, running up into the hundreds.

The Sentinel learns that every spring and all the timber along the proposed line of the Eureka and Colorado Railroad through White Pine County has been located by speculative persons, desirous of making a turn out of the construction of the road. A good many active Eureka people have driven stakes of the character mentioned.

The Richmond Works were started up again yesterday, and it looked quite like old times to see the smoke issuing from the various stacks. The Richmond has an immense supply of coal on hand. Not only are the bins filled with every bushel they will hold, but the hillside back of the furnaces are covered with sacks of the black diamonds.

The Richmond Company consumes between 13,000 and 14,000 cords of wood annually. The Richmond Company have about 7000 cords of mahogany and cedar wood piled up, and in close proximity to the works.

Messrs. J. T. Gilmer and O. J. Salisbury left by private conveyance yesterday morning for Secret Canyon, to examine their valuable mine at that place.

Henry Allen has just completed the erection of a new furnace for the Ruby and Dunderberg Company, and is entitled to great credit for the prompt and workmanlike manner in which it has been finished.

Dr. Bees is doing vigorous work on the Kemp and Keen series of mines on Prospect Mountain. The doctor informs us that the whole series are looking exceedingly well.

The owners of the Dug Out Mine will commence hauling 100 tons of first-class ore to the Eureka Consolidated Works to-day.

London, Aug. 10.

RUBY HILL.

NEW MINES IN NORWAY—HVIDESEID SILVER AND COPPER MINES.

SIR.—As my former letter seems to have had some interest I thought a report of a visit to some of the mines would be equally interesting, and so I wished to inform you of some facts respecting the above-named mines. The history of these mines is this:—As the district was very rich in ores a gentleman—but without sufficient capital—built a little smelting-works, and the peasants mined out ores, and sold them to him. The mining was done in a very primitive manner, and the ores were transported on horseback to the works; but they were so rich that the mining of but a few fathoms of ground was sufficient to yield what the peasants called a capital (that is, enough to retire upon). The smelting-works, however, were not continued, and several of the miners, therefore, transported the ores over many miles to Kongsberg. The ores were so rich that they, though only hand-dressed, paid the transport as well as a profit. But there were many difficulties by this method, and the mines were, when a "clode" was taken away, left. Another rush was made some years ago; but in another part of the district, and at another time I also will tell the history of these mines. I now only am reporting of the mines which are situated on the northern side of Bandazvaad, about one English mile distant from the water. These mines lie in a line going parallel with Bandaz, and the distance between them is but little. It seems as though a rich metallic eruption took place, which broke the slate, the metals being especially copper (in rich blue and yellow copper ores), and lead with more or less silver. I inspected then a complex of mines and ore lodes, and their description is as follows:—About one English mile from the valley I found Gravegruben (the mine of Grave), where they have mined down about 6 fathoms, and in the bottom, which is about 4 fms. wide, there is standing an ore wall, consisting on the right hand of 5 ft. fine blue copper, and so continuing to the left impregnated with blue copper and iron, as I think also argentiferous (I later made a qualitative assay, and found silver). It was an admirable mass of ore. About a mile therefrom we came to Sölvbergid, with fine lead and yellow copper; at a depth of 6 ft. the quartz* lode was said to measure 5 ft., and whereof 2 ft. were mixed with ore. There was some water in the mine. The samples of ore were very fine. At Johnslid there is in the bottom of a short adit level to see 2 ft. very fine, some places solid yellow copper. At Bjorgstoll there is solid rich yellow copper, 4 in., increasing; another place in the lode almost pure copper and blue copper. These three lodes are very extensive. We came to Bygstoll (also named Drillerhoe), about a mile far; it was said that it was the same vein as at Sölvbergid. The quartz lode was 5 ft. wide, containing more or less lead and copper ores—yellow and blue. There were ore all the way, and very fine ore stones were lying by the mine. There was a supply of water in the neighbourhood. The lode is to be found continued between the mine and Sölvbergid, containing a little lead, but more yellow copper. Rödbergnubur

* It was reported to me that it was calcspar, and so I was misinformed.

was said laying in a distance, an unworked but extensive quartz vein, with good indications of lead, as I was told there; it ought to be explored. About 1½ mile further we came to Kroksmyr, a very valuable and extensive lode (blue copper, argentiferous; assays have given up to 38½ per cent. copper and 35 ozs. silver per ton of 20 cwt.) There has been some work done here, and there were traces left by the old miners, which testified that there had been an uncommonly large quantity of rich ore. There can now be seen a quartz vein, containing more blue copper than quartz, increasing in a distance of only 6 ft. downwards from 4 in. to 3 feet. The old miners have done their work wrong. It was said that they found an almost clean mass of blue copper, 2 to 3 fms. long, and of an important depth, and the remains of these operations were to be seen among the stones. The mine was said to have been uncommonly rich. The lode can be followed a long way, and was said to go to Störslaat, where the same fine blue copper was to be seen in the quartz lode; there was but little work done here, but the lode was increasing. The ores from Kroksmyr and Störslaat may be transported another way than the ores from the other mines—about 2½ miles; the roads from all the named mines will be the same for about half a mile from the steamboat quay. There is at these last-named mines a supply of water for washing and dressing. In the winter there will be found good ways to all the mines for the heaviest transport—say, boilers and machinery—and there are no difficulties to build ways for the heaviest transport. I was very satisfied by the visit, and surprised at the richness of the mines. I have now mentioned some valuable mines belonging to a company who has secured itself the properties, and it is much to be wished that these rich nests within no long time could be brought out in the daylight.

OBSERVER.

MARBELLA IRON ORE—CARADON CONSOLS.

SIR.—Your correspondent, "Scotch Mining Engineer," does not agree with my statement sent you on July 30 as to profits made by this company. I grant he is correct in stating the gross profits are 8947*l.*, but what have shareholders to do with gross profits? What they look to are the net profits from which they are to receive dividends, and those I correctly mentioned. His remark about buying his shares in I cannot understand, as from former letters in the Journal I presumed he was a large shareholder. As to the new lease he will find on enquiry that I know more about it than he seems to do; at the same time, I do not expect there will be any difficulty in getting it renewed.

Another Glasgow mine—the Caradon Consols—is well worth the attention of investors. Shares are now very low. The mine never looked better, and from the various points now opening up a discovery may be made any day that will double the value of the property.

IRON AND COAL.

LIMITED LIABILITY, AND THE COST-BOOK SYSTEM.

SIR.—I am sorry to trouble you again on this subject; but the one-sided statements of the writer in Messrs. Watson's Circular, in last week's Journal, oblige me to do so. He gives a list of mines in Cornwall and Devon that have yielded large profits in the last century or so, and with an air of triumph points to the fact that they were conducted on what he calls "the much abused Cost-book System." But what on earth has the richness of these mines to do with the constitution of these companies? They would have paid largely under whatever mode the necessary capital had been raised. But what a negative would have been given to the writer's view if he had stated the number of Cost-book mines in the above counties which during the same period have turned out complete failures, together with the amounts which some shareholders had been compelled to pay on account of the default of others, and the list of these who had been ruined through unexpected liabilities. Here let me say that Devon Consols was never under the Cost-book, but was constituted under a Special Deed of Partnership.

The writer alluded to says that Limited Liability companies have never done much good, and that "dividends in most of them are remote." I cannot help thinking he has wilfully shut his eyes to the fact that Limited Liability has been in existence barely 20 years, and the following mining companies, among others thus constituted, have paid dividends:—

Great Laxey, about	£385,000
Grogwinion, "	16,000
Isle of Man, "	232,000
Leadhills, "	15,000
Lisburne, "	244,000
Mellanear, "	14,000
Minera, "	600,000
Roman Gravel, "	102,000
Tankerville, "	58,000
Van, "	375,000

It is strange how the writer in Messrs. Watson's Circular ignores everything against the Cost-book, and everything in favour of Limited Liability.—*Aug. 10.*

G. W. RITCHIE.

MINERS SMELTING THEIR OWN TIN.

SIR.—A writer in last week's Journal spoke of a mine (where I do not remember) as the only mine in the world whose proprietors smelt their own tin. I wish to correct that error—for so it is—by stating that about the year 1822 the Wheal Vor Mining Company erected smelting-works on their chief mine (Wheal Vor) for reducing their tin ore to metal, where they returned a larger quantity than any mine in Cornwall ever did. It was collected from their several mines—Wheal Vor, Carleen, Wheal Vreah, Polladras, Pol-down, Wheal Metal, Penhale, and Wheal Sithney—the whole of which were relinquished in 1844. They did not, however, continue to smelt all their tin ore there—they sometimes sent a part to the smelting companies.—*Truro, Aug. 9.*

R. SYMONS.

CIVIL ENGINEERS, &c.

SIR.—A gentleman of the name of Silas Nicholls, C.E., came on a visit to St. Columb a few weeks ago, and introduced to the inhabitants of that town and its vicinity the subject of road tramways worked by locomotives. He recommended the laying down of a tramway from that town to St. Columb Road Station, on the Cornwall Minerals Railway. He also held a meeting at Truro, and recommended the construction of a tramway from the Cornwall Railway Station to and through the city to Malpas. No doubt the suggestions were very good and practicable after the gradients of the two roads are reduced to 1 in 20. At present the gradient at Trekenning by St. Columb is too steep for a locomotive with carriages attached. Before a tramway could be conveniently laid down there the valley should be raised for the road at least 40 ft., by the debris from the cutting down on the hill on one or both sides. As to Truro the reduction of Richmond Hill 9 ft. will make the road fit for the reception of a locomotive tramway, which should be constructed, as advised, to Malpas, with a branch over Lemon Bridge to Truro Foundry, and other short branches. I should like to see a line of tramway constructed from Truro via Rosvigo Bridge, Perran Alms House, and Boleingy to Perranporth. As the cost, compared with the railways in general use, would be light the traffic in goods and passengers would yield a fair return on the expenditure.

Some person raised the question as to the engineering abilities of Mr. Nicholls, and examined the list of civil engineers published by the Society to see if his name was inserted therein. Not finding it there it was said that he ought not to call himself an engineer, as though every man qualified for engineering must necessarily have his name in that record. The supposition is absurd. There are probably scores of names there of men who know very little of the science and nothing of the practice of engineering. The late Sir F. M. Williams, Bart., M.P., was a member, and knew nothing of the subject. So the membership is no test of ability. There is no examination of the candidates prior to admission into the Society, which is obtained on the recommendation of two, three, or more well-known members—by ballot. To obtain admission a fee of 9½ guineas must be paid for the first year, and 2½ guineas yearly afterwards. Many well-qualified engineers object to pay the money, preferring, therefore, to stand outside the Society, and many members failing

to keep up the payment cease to be members. It is grossly absurd to suppose that a man by uniting with the Society all of a sudden becomes a clever man. There are, I doubt not, many non-members quite as clever as any members of the Society. R. SYMONS.
Truro, Aug. 9.

BEDFORD UNITED MINE.

SIR,—I am highly gratified to notice that the 20 east has reached a mass of gossan. When this cap is of the right material it is invariably in this district, at any rate, the forerunner of a gulf of ore. One of the best judges in the neighbourhood, in whose company I often wandered over the breezy downs, told me that the discovery at Devon Consols was entirely owing "to a good eye for gossan," and here the deposit was 20 fms. deep, and under it such a lane of ore as astonished the whole world. The Bridge lode, as it is now well known, is a parallel one to the celebrated Marquis, which, although small at times, yet very frequently swelled out to 9 tons of the best copper ore per fathom, and here the gossan was first rate, and, what is still better, substantial dividends were regularly paid for many years. It is not generally known that there is an old mine resuscitated, called the Old Gunnislake, formerly very productive, situated between Bedford United and the good Old Clitters, where, at a distance of 200 fms. south, a very fine lode has been cut 10 ft. wide. Perhaps this is the Old Crebor lode, and the long-neglected Fair Georgina lode may be still further south. At any rate, they are attacking the Bridge lode with their new boring machinery with marvellous speed. Thus, it is quite clear that this fine lode, which is so much admired, is being proved at both ends—at Crebor and the Old Gunnislake, as well as in the Bedford United. I wonder whether the little gem West Crebor, which has lately started between these two sets, will be benefited by all these rapid explorations? AN OLD AMATEUR.

BEDFORD UNITED MINES.

SIR,—On going through a pile of reports which have come into my hands during my connection with this mine as a shareholder for the best part of 40 years, I find that in November, 1873, our present secretary wrote in a circular to the shareholders—"A cross-cut has been driven from the south lode 25 fms., and as soon as circumstances permit operations will be resumed with a view to cut the Bridge lode, which is considered by many practical authorities to be a most valuable lode." At about this time it appears that the South lode was attracting much attention, and I read in the same circular—"It appears that a course of ore is imminent, and any day may place the mine in such a position as to put a stop to further demands on the shareholders." And in the following March the agent's report said—"The 47 east on the south lode is yielding sufficient ore and muddle to cover the cost of driving, and is highly promising." In the July following the agent remarks—"I am still of opinion that good deposits of ore will be met with in prosecuting these points (the 47 and 35 fms. levels)." In November, 1874, a course of yellow ore was expected, and in July, 1875, it was stated that "the rise had communicated with the old workings, and that many hundreds of fathoms of ground have been laid open in this lode, which will ultimately be available for stoping." In the following July came a change in the local management, since which there has been scarcely any reference to the south lode, although if reports were to be relied on there appeared every chance of a profitable concern.

It is not so much with regard to the south lode (although I should like to know why operations were there suspended) that I write, but the Bridge lode, which appears to me to be gradually developing into a productive and lasting property. As yet it is only in its infancy, although very promising, and what results may be when the inevitable course of yellow ore is intersected in the shaft it is difficult to say, but judging from similar appearances and discoveries elsewhere I am pretty sanguine of a great and rich mine. We all know that a parallel lode—the Wheal Marquis—returned to us 13l. 10s. per share (or 54,000l.) in dividends, and seeing that the south lodes have invariably proved productive in this district, and that the Bridge lode is not unlike the lode in Wheal Emma (Devon Consols), there can scarcely be a doubt but that the old mine will ere long find its place in your Dividend List. I have nothing to do with market operations, and simply write what I believe from a long acquaintance with the mine, and a careful study of the reports furnished from time to time. Considering the future prospects I think the quotations are far below the real value of the property, and whilst there are doubtless some few equally as good investments my belief is that Bedford United will yet be amongst the best mining enterprises of the day. I would wish to see a little more information afforded to outside shareholders by the manager, and of late I have missed the frequent and welcome circular of our secretary. A SHAREHOLDER.

WEST POLGOOTH.

SIR,—This mine is situated near the village of Sticker, about 2½ miles west of St. Austell. A correspondent of yours asks if anything is being done in the mine. When I was at Sticker a few weeks ago I enquired about the mine, and was informed that the working was suspended—I suppose for want of capital. It is, I understand, worthy of prosecution.—*Truro, Aug. 9.* R. SYMONS.

WHEAL JANE MINE.

SIR,—I cannot allow the remarks of Captain Richard Southey, in reference to myself, to pass unnoticed owing to the baseless insinuations implied. I, my friends, and clients are largely interested in Wheal Jane, and, as the reports of late have been so meagre and frequently irregular, I requested to have the report for the last meeting sent up to my office (being one of the committee), because I wished certain statements made in that report, so that outside shareholders (my clients and others) might know more and have fuller particulars about their property than possibly Capt. Southey might have given in his report. Not being able to attend the meeting I communicated to Mr. Hocking, the purser, what I wished stated in the report, as it would give tone and value to a deserving property, which Wheal Jane most decidedly is.

My letter to Mr. Hocking was as follows:—"I wish Capt. Southey to state in his report what has been done in the past twelve months; how many tons of tin sold; how many hands employed; how many engines, and what other machinery upon the mine, &c.? If the machinery and all the buildings had to be erected what they would cost? I estimate 15,000l.—not far wrong, I fancy." I had a right as a large shareholder to ask these questions and any others; and I had also a right (being a member of the committee) to request that they be embodied in Capt. Southey's report. His report was a miserable affair, and not one word of my request put in; this was, no doubt, purposely done.

For some time past I have been dissatisfied with the management of Wheal Jane, and had Capt. Southey not resigned it was my intention to let him understand it would be advisable for him to do so at the November meeting. The expenses of management have been too great for such a mine; his resignation will save 100l. yearly, and it is possible other changes may be made at the next meeting.

I would here remark that in June last I paid a visit to Wheal Jane, and saw the resident agent, Capt. William Roberts, when the following conversation took place:—"I said to Capt. Roberts, 'Our expenses of management here are too heavy, and will have to be reduced. How often is Capt. Southey here?' He replied, 'Three times a week.' I then asked him if he thought he could undertake the management of the mine, and he replied that he thought he could. I further remarked that a good captain and pitman were quite sufficient for such a property—a manager was not necessary. I have no doubt that my remarks were communicated to Capt. Southey; hence his resignation, which has given me and others great satisfaction.

Capt. Southey states in last week's Journal that Wheal Jane was more than 2000l. in debt when he undertook the management. He has left it more than 2000l. in debt. After all the heavy calls made the mine ought certainly to be in a better position—thanks to the shareholders' pockets. Capt. Southey has done what he was paid to do. I confess I have lost confidence in Capt. Southey, and believe I am not the only one. I went into West Chiverton on the strength of his reports, and put my friends and clients in; one friend in particular bought at 18l., and sold at 30s. He was going to do wonders

in this mine, and what has been the result? Thus far a miserable failure—nothing but calls, and shares unsaleable. It is to be regretted that Capt. Southey too frequently forgets his position; he would act as owner and dictator, instead of a paid servant of a mine. However, I am very thankful he has resigned, as it saves a gentle dispensing of the manager's services, through too heavy expenses in the management of the mine. H. GOULD SHARP.
21, Threadneedle-street, London, Aug. 10.

GREYSTONE MINE.

SIR,—This mine of argentiferous lead is situated in the parish of Lezant, about 2½ miles south of Launceston, Cornwall, in the land of a Mr. Mitchell, who occupies the farm. The mining lease comprehends all the estate, which is large for a Cornish farm. About two or three years ago the lease for mining was granted to Mr. E. A. Hickey, of Cannon-street, London, who, with one other gentleman, have paid all the costs up to this date, amounting to about 4000l. The prospects are very fair, but he has found the landowner a disagreeable man. The lease contains the usual covenants, except one, which is not only unusual but unrighteous, and which, unfortunately, the lessee overlooked. It begins in the customary wording, to the effect that for all the land permanently destroyed the lessee or his assigns should pay 100l. per acre, but that the landowner's agent should decide what should be deemed and taken to be permanent destruction. For all land occupied, but not permanently destroyed, the charge is 1s. per perch per annum, to which no objection was made, although that was double its value.

A few weeks ago an account was sent to the lessee demanding about 120l. for rent and land destroyed. Shortly afterwards a writ was served on him for that amount. He entered an appearance, and instructed me to ascertain what damage was done, that fair compensation might be made. I very carefully measured the several pieces taken, and found that the land permanently destroyed was 15 perches, and that the portion occupied and temporarily waste was 2 r. 32 p.: total, 3r. 7 p. Under the wicked clause referred to the lessor charged nearly 3 roods instead of 15 perches for land permanently destroyed, being an overcharge of about 60l. in money.

When the case came on for hearing at the Bodmin Assize, lessee's solicitor, from a perusal of the covenant, found that there was no legal ground for defence; he, therefore, consented to a verdict for the amount claimed, minus 10l., which plaintiff's solicitor consented to remit. It is to be regretted that the lessee overlooked or did not see the effect of the clause referred to. I may venture to say that such a clause was never inserted before in any lease in Cornwall. Except the 15 perches, which is the space covered by a shaft pile, the whole of the waste can be reclaimed and made arable for about 10l., which the lessee would do in proper time. The lessee paid the landowner 400l. to have possession of the mine, which is still in its infancy. A former lessee did a little work there, and built a small account-house, for which the present lessee is charged 8l. per annum. *Truro, Aug. 8.* R. SYMONS.

GREAT WHEAL POLGOOTH MINING COMPANY.

SIR,—In last week's Journal it is stated that it is but fair to Gen. Nuthall, whose name appeared in the prospectus of the Great Wheal Polgooth as one of its directors, to mention (among other matters) that he resigned his office of director on April 5, "before any allotment had been made." Kindly permit me to state that the shares for which I unfortunately applied, in reliance on the prospectus, were allotted to me about a fortnight earlier than April 5, and paid for in full by a cheque sent to the Imperial Bank on March 29, while Gen. Nuthall, as well as all the other directors who had aided and abetted in the perpetration of the prospectus, was fully responsible, legally as well as morally, for the assertions made in it, and for all their consequences. I am sure you will consider it but fair to those shareholders the allotment of whose shares was made prior to the publication of Gen. Nuthall's withdrawal to insert this letter in the Journal.—*Bath, Aug. 8.* W. H.

GREAT WHEAL POLGOOTH MINING COMPANY.

SIR,—My attention having been called to your report, in last week's Journal, of the meeting of the Great Wheal Polgooth Mining Company, in which the name of Charles Morgan appears, I beg you will be good enough to announce in your next number that I am not that person, nor have I been in any way connected with the company.—*Capel Court, E.C.* C. MORGAN.

ON SOME RECENT IMPROVEMENTS IN LEAD PROCESSES.*

BY MR. NORMAN C. COOKSON, OF NEWCASTLE.

Probably in few trades have a smaller number of changes been made during recent years in the processes employed than in that of lead smelting and manufacturing. In the North of England we find the old Scotch ore hearth and the slag hearth still in operation, and by the former the bulk of our local ores are smelted. In the next stage of manufacture—desilverising—we find the Pattinson process worked substantially in the same way as when originally introduced by the late Mr. Hugh Lee Pattinson in the year 1833; in some cases with a few improvements, but generally unchanged. By this process, locally termed separating, most of the silver-lead is operated upon; but of late years two other processes, presently to be described, have been largely worked on the Tyne. In sheet-lead rolling there is no alteration in principle since the time when the first mill took the place of the old casting-floors some centuries ago. But in a mill put up a few years since by the writer's firm they introduced many very important improvements in detail. In pipe manufacturing the only change is from pipe-drawing to pipe-pressing, by means of the hydraulic press; and in the modern pipe press solid cores are now used, almost to the exclusion of the old-fashioned split cores. In shot making, since the time when Messrs. Walker, Parker, and Co. put up their first shot-tower, and when, very shortly afterwards, Messrs. Locke, Blackett, and Co., to avoid the expense of a tower, substituted a disused pit shaft, no changes have taken place. An ingenious American has, however, patented a process for using a short shaft of some 8 ft. or 10 ft. in height, through which as the molten shot drops fall they meet a strong current of air, urged by a fan, which answers the purpose of the long drop of a tower or pit. In the manufacture of white lead the old Dutch process, the same as has been used for many centuries, produces in this country at least nine-tenths of all that is made, and of a quality not yet surpassed, if equalled. As to red lead making, neither in the old ovens nor in the mode of working them has there been any alteration.

The object of this paper, however, being to describe not what is unchanged, but some recent improvements in lead processes, the writer will briefly describe a few, and those more especially with which he is best acquainted—namely those applied to desilverising and sheet-lead rolling. Before describing desilverising by the steam process, as it is worked by the writer's firm, it will be well to give a short description of the Pattinson process, inasmuch as in principle the two are almost identical. The Pattinson separating process is based on the fact that when melted silver-lead cools the crystals first forming contain less silver than the portion which remains longest liquid; and in practice it is worked as follows. A set of about ten or a dozen cast-iron pots, holding from 5 tons to 15 tons each, are placed in a row. Of these the last, or market pot, is generally smaller than the others. Should the lead to be worked contain say, 25 ozs. of silver per ton of lead, it will probably be filled into the middle pot of the series. It will then be melted; and when the whole is thoroughly liquid the fire will be drawn, and the lead allowed to cool. As it cools a workman keeps stirring the lead, and slicing, or freeing from the sides, the portions setting on them. As the cooling proceeds crystals begin to form; and when a sufficient quantity appears a second workman withdraws the crystals from this pot with a perforated iron ladle, and passes them into the pot to his right, and continues doing so until he has thus moved two-thirds of the lead. When he has done this, he withdraws with a solid bottomed ladle the one-third of liquid lead remaining, and moves it to the pot on his left

The centre pot is again filled with original silver-lead, and the same operation is repeated. If this has been properly conducted it will be found that the liquid lead removed to the left instead of containing 25 ozs. of silver per ton, as did the original lead, will now contain 50 ozs. per ton; and the crystals moved toward the market pot will now only contain 12½ ozs. of silver per ton. It will readily be seen that by repeating this operation successively in the various pots the poor lead gradually becomes poorer, until it is so free from silver as no longer to pay for working; while the rich lead on the other hand will gradually increase in richness till its silver contents make it fit for the refinery. Although other processes for desilverising are extensively worked, the original Pattinson process is still that which is most largely used in England.

The steam desilverising process as used in the works of the writer's firm, and in other works licensed by them, is the invention of Messrs. Luce Fils et Rozan, of Marseilles; it is one which should commend itself especially to engineers, as in it mechanical means are employed instead of the large amount of labour used in the Pattinson process. The steam desilverising process instead of using a row of pots as in the old process, consists of two pots only; of which the lower C, Fig. 1, is placed at such a height that the bottom of it is about 12 in. to 15 in. above the floor level, while the upper, M, is placed at a sufficiently high level to enable the lead to be run out of it into the lower pot. The capacity of the lower pot, which in those most recently erected is 36 tons, should not be less than double that of the upper one. Round each pot is placed a platform, on which the workmen, of which there are two only to each apparatus, stand when skimming, slicing, and charging the pots. The upper pot is open at the top, but the lower one has a cover with hinged doors, and from the top of the cover a funnel is carried to a set of condensers. At a convenient distance from the two pots is placed a steam or hydraulic crane, so arranged that it can plumb each pot and also the large moulds which are placed at either side of the lower pot.

The mode of working is as follows. The silver-lead is charged into the upper pot, M, by means of the crane. When melted the dross is removed, and the lead run into the lower or working pot, C, among the crystals remaining from a previous operation. When the whole charge is thoroughly melted it is again drossed; and in order to keep the lead in a thoroughly uniform condition, and prevent it from setting solid on the top and the outside, a jet of steam is introduced from the pipe, P. To enable this steam to rise regularly in the working pot, C, a disc-plate, D, is placed above the nozzle, which acts as a baffle-plate; and uniform distribution of the steam is the result. To quicken the formation of crystals, and thus hasten the operation, small jets of water are allowed to play on the surface of the lead. This, it might be thought, would make the lead set hard on the surface; but the violent action of the steam acts in the most effectual manner in causing the regular formation of crystals. Owing to the ebullition caused by this action of the steam, small quantities of lead are forced up, and set on the upper edges and cover of the pot. From time to time the valve controlling the thin streams of water playing on the top of the charge is closed, and the workman opening the doors of the cover in rotation, breaks off this solidified lead, which falls among the rest of the charge, and instantly becomes uniformly mixed with it. Very little practice enables an ordinary workman to judge when two-thirds of the contents of the big pot are in crystals, and one-third liquid; and when he sees this to be the case, instead of ladling out the crystals ladleful by ladleful, as in the old Pattinson process, he taps out the liquid lead by means of two pipes controlled by valves, the crystals being retained in the pot by means of perforated plates. The liquid lead is run into large cone-shaped moulds on either side of the pot; and a wrought-iron ring being cast into the blocks thus formed they are readily lifted, when set, by the crane. To give some idea of the rapidity of the process, it may be mentioned that from the time the lead is melted and fit to work in the big pot to the time that it is crystallised and ready for tapping, is, in the case of a 36 ton pot, from 35 to 45 minutes, and the time required for tapping the liquid lead into the large moulds is about 8 minutes. Before the lead begins to crystallise the upper pot is charged with lead of half the richness of that in the lower pot. Thus when the liquid lead has been tapped out of the lower pot, it is replaced by a similar amount of lead of the same richness as the remaining crystals by simply tapping the upper or melting pot, and allowing the contents to run among the crystals. The same operation is repeated from time to time, until the crystals are so poor in silver that they are fit to be melted and run into pigs for market. The large blocks of partially worked lead are placed by the crane in a semicircle round it, and pass successively through the subsequent operations.

This process has other great advantages in addition to that of saving labour. In the first place, after taking into account the fuel used for supplying the crane power, and the steam for crystallising, it still shows a great economy in fuel. In the case of the writer's firm they find that, as compared with the Pattinson process, as formerly carried out by them, they only use one-third of the amount of coal, though of a slightly better quality. Another most important advantage is that the steam, in addition to its mechanical effect, produces an effect of a chemical nature. Almost all silver-leads, as received, contain impurities, such as copper, arsenic, iron, and antimony. In the Pattinson process these extraneous metals had to be removed by calcination, before the lead could be used in the separating department. But it is found that in the Rozan or steam process these extraneous metals, if they exist in moderate quantities (as is usually the case in English, Spanish, and other leads of similar quality), are readily oxidised by the steam; and that their presence in the desilverising apparatus, instead of being a disadvantage is a positive advantage, since where a small quantity of antimony or copper exists its presence has the effect of lessening the oxidation of the lead. A small quantity of lead and other oxides is carried mechanically from the lower pot by the steam and by other gases, which escape from it after having done their work; but these are conducted by the funnel on the top of the pot cover to condensers, where the metals are practically all recovered. These oxides are found to contain a very large quantity of antimony and copper, and in colour are nearly black, instead of the yellow proper to pure lead oxide.

To sum up, the advantages of the steam process, as compared to the old 6-ton Pattinson pots formerly used by the writer's firm, are:—(1) a saving of two-thirds amount of fuel used; (2) the saving of cost of calcination of the lead, to the extent of at least four-fifths of all that is used; (3) above all a saving in labour to the extent of two-thirds. The process has its disadvantages, and these are a larger original outlay for plant, and a constant expense in renewals and repairs. This is principally caused by the breakage of pots, but with increased experience this item has been very much reduced during the last two or three years.

The third method of desilverising worked in this district is the zinc process, which is largely used by Messrs. Locke, Blackett, and Co., and was patented in the form adopted by them about 14 years since. The action of this process is dependent on the affinity of zinc for silver; the following is a brief description of it. A charge of silver-lead, usually about 15 tons, is heated to a point considerably above that which is used in either the Pattinson or the steam process. The quantity of zinc added is regulated by the amount of silver contained in the lead; but for lead containing 50 ozs. to 1 ton, the quantity of zinc used is in most cases about 1½ per cent. of the charge of lead. The lead being melted as described, a portion of this zinc, usually about half of the total quantity required for the charge, is added to the melted lead, and thoroughly mixed with it by continued stirring. The lead is now allowed to cool, when the zinc is seen gradually to rise to the top, having incorporated with it a large proportion of the silver. The setting point of zinc being above that of lead, a zinc crust is gradually formed, and this is broken up and carefully lifted off into a small pot conveniently placed, care being taken to let as much lead drain off as possible. The fire is again applied strongly to the pot, and when the lead is sufficiently heated a further quantity of zinc, about one-third of the whole quantity used, is added, when the same process of cooling and removing the zinc crust is repeated. This operation is gone through a third time, with the remaining portion (¼ per cent.) of zinc; and if each of these operations has been carefully carried out the lead will be found

* Transactions of Institution of Mechanical Engineers.

to be completely desilverised, and will only show a very small trace of zinc. In some works this trace of zinc is allowed to remain in the market lead, but at Messrs. Locke Blackett and Co.'s works it is invariably removed by subjecting the lead to a high heat in a calcining furnace. The zinc crusts, rich in silver, are freed as far as possible from the lead by allowing this to sweat out in the small pot, after which the crusts are placed in a covered crucible, where the zinc is distilled off, and a portion of it recovered. The lead remaining, which is extremely rich in silver, is then taken to the refinery, and treated in the usual manner. The writer is given to understand that the quantity of zinc recovered is as high as from 50 to 60 per cent. of the total quantity used. This process has much to recommend it in the small original cost of plant, the small amount of labour, and the extreme quickness with which the lead can be treated. The stock of working lead required is also small as compared to either the Pattison or the steam process. Against this, however, is to be set the cost of the zinc which is lost; and when the writer watched the working of the process carefully some years since the results in silver and lead were not so satisfactory as he had been led to expect.

Although it was said that the rolling or milling of lead remains unchanged in its main features since the first mill was established, yet the writer's firm have introduced many important improvements. Of one of these advantages is, perhaps, more felt in the desilverising than in the rolling department; and in the following way. When lead is required for sheet making, instead of running out the market lead into the usual pigs of about 1 cwt. each, it is run into large blocks of $\frac{3}{4}$ tons; and by so doing a very great saving both of time and labour is obtained. The $\frac{3}{4}$ -ton blocks are taken on a bogie to the mill-house, where the mill melting pot is charged with them by means of a double-powered hydraulic crane, lifting, however, with the single power only. Three such blocks fill the pot, and when melted are tapped on to a large casting plate, 8 ft. 4 in. by 7 ft. 6 in., and about 7 in. thick. This block, weighing 104 tons, is lifted on to the mill table by the same crane as fills the pot, but using the double power; and is moved along to the rolls in the usual manner by means of a rope working on a surging head. The mill itself, as regards the rolls, is much the same as those of other firms; but instead of an engine with a heavy fly-wheel, always working in one direction, and connected to the rolls by double clutch and gearing, the work is done by a pair of horizontal reversing engines, in connection with which there is a very simple, and at the same time extremely effectual, system of hydraulic reversing. In the usual method there is no necessity for full or delicate control of lead mill engines, but with this system it is essential, and the hydraulic reversing gear contributes largely to such control. This may be explained as follows:—In all other mills with which the writer is acquainted when the lead sheet, or the original block, has passed through the rolls, and before it can be sent back in the opposite direction, a man on either side of the mill must work it into the grip of the rolls with crowbars. In the writer's system this labour is avoided, and the sheet or block is fed in automatically by means of subsidiary rolls, which are driven by power. When it is required to cut the block or sheet by the guillotine, or cross-cutting knife, instead of the block being moved to the desired point by hand-labour, the subsidiary driven rolls work it up to the knife; and such perfect control does the engine, with its hydraulic reversing gear, possess that should the sheet over-shoot the knife $\frac{1}{2}$ in., or even less, the engine would bring it back to this extent exactly.

Another point, which the writer looks upon as one of the greatest improvements in this mill, is its being furnished with circular knives, which can be set to any desired width, and put in or out of gear at will; and which are used for dressing up the finished sheet in the longitudinal direction. This is a simple mechanical arrangement, but one which is found to be of immense benefit, and which, in the writer's opinion, is far superior to the usual practice of marking off the sheet with a chalk line, and then dressing off with hand knives. The last length of the mill table forms a weighbridge, and an hydraulic crane lifts the sheets from it either on to the warehouse floor or the tramway communicating with the shipping quay.

Though the description of the steam desilverising process, and of sheet lead rolling, which the writer has endeavoured to give, may not perhaps have been so clear and interesting as he would have wished, he feels sure that those members who visit the works and see the processes in operation, will be able to follow them through with facility, and will find their details of considerable interest. It will afford him much pleasure to explain on the spot any other matters now omitted for the sake of brevity.

THE LANGLEY BARONY LEAD MINES.

The Institution of Mechanical Engineers paid a visit to the Langley Barony Lead Mines, near Haydon Bridge (Messrs. T. J. Bewick and Co.), in which a large number of the members took part, amongst them being the President (Mr. E. A. COWPER). Leaving the train at Haydon Bridge, where the party was received by Mr. T. J. Bewick, they were taken by carriage to the Langley Barony Mines, a distance of about two miles. The Honeycreek works were the first visited. Here, before inspecting the modern machinery used, the visitors were shown the old cumbersome process of ore dressing by manual labour when the works were first opened, and nothing could be more striking or better illustrate the advancement that has been made in mechanical science than the contrast it formed with the elaborate machinery now employed for the work. Those who were desirous of going underground had an opportunity of doing so here, but few of the visitors availed themselves of it. Passing into the works the party were shown the various machines and processes for separating the lead ore from the valueless material with which it is intermixed. These include crushing mill, jigging machinery, several buddles of different descriptions, and other appliances, as well as engines engaged for driving the machinery, in which special interest was taken—Davey's single cylinder non-condensing pumping-engine, the working of which was explained by one of the officials of the works. The whole of the machinery and working plant was carefully inspected, and was a source of much interest to the visitors. After visiting the Leadbitter shaft the party went on to the Joicey shaft. There was seen more machinery of a similar description to the last, but more compactly put together; this being a later part of the concern. In going over the works the different processes were explained in a very instructive and interesting manner by Mr. Bewick, who was ever ready to relieve the curiosity of his visitors on any point. Leaving the Joicey shaft the party returned in the carriages to Haydon Bridge, by way of Cuckstubs, near which the elevation is said to be 745 ft. above the level of the sea. An excellent luncheon was provided in a large marquee. The chair was taken by Mr. T. J. Bewick, who was supported right and left by the President of the Institution (Mr. Cowper), Mr. John Spencer, Mr. W. Cochrane, Mr. W. Benson (Allerwash), Mr. Riddell (Hexham), Mr. Sopwith, Mr. B. C. Browne, Mr. Ralph Brown (Benwell), Mr. A. Leslie, Mr. Edward Leadbitter, and the Rev. Dixon Brown, the three latter and the Chairman being directors of the Langley Barony Company.

The CHAIRMAN, having submitted the usual loyal toasts, proposed "The Institution of Mechanical Engineers." In the name of himself and partners he said he was glad to have been honoured by the presence of a body of gentlemen to whom the nation—he might say the world—were deeply indebted for their studies and consequent knowledge of mechanics. (Applause.) He was sure all present, especially those who were not engineers, would have special pleasure in drinking success to the Institution of Mechanical Engineers, an institution he believed having over 1200 members, and representing the greatest amount of mechanical wisdom, power, and capital. (Applause.) He had the honour to be a member of the Institution of Civil Engineers, who were, of course, proud of their position, and who in science and in designing works might perhaps put themselves on an equal position with the mechanical engineers; but there was no doubt that the great amount of capital invested in works was represented by the Institution of Mechanical Engineers. They had not seen much at the Langley Barony Mines. ("Yes, yes.") It was not possible to see so much to entertain mechanical engineers at mines like these as at places like the Elswick Works, Palmer's, or he might add Mr. Leslie's; but they had a speciality, and he hoped that speciality had pleased them. At any rate he hoped they had been pleased with their visit, and that it had been a day's outing they would recall with pleasure. That was the only wish of his partners and himself in inviting them that day. He coupled with the toast the name of their president, Mr. Cowper. Mr. Cowper had shown them what a president could be. (Hear, hear.) "Universal" or some such term as that was really applicable to their president. He knew everything, no matter whether it was a printing machine, or a blasting-furnace, or anything else. Mr. Cowper was capable of explaining it. (Cheers.)

The PRESIDENT, in responding to the toast, said their excursion that day had not only been a pleasing meeting, it had been a most instructive day's proceedings. Notwithstanding what Mr. Bewick had said he was sure their pleasure that day as mechanical engineers had been unimpaired. He had noticed improvements in the machinery upon that used when he was last here, 12 years ago; and it was for the purpose of their being able to see such improvements as these that this institution was originally formed. He believed when the institution was formed they never had any idea that it would be so thoroughly successful as it is now. Some of the discussions at their meetings had been really such as any institution in the world might be proud of. They knew, too, how institutions in France, Germany, and America, looked to them for information, and they saw Americans frequently coming forward to join them. Certainly this institution was at the head of the mechanical engineers of the world. (Hear, hear.) He did not say that the Institution of Mechanical Engineers in France was not very much to the front in some respects. In America, too, they carried

a good pressure, but certainly at the present time they in England were decidedly to the front. (Applause.) He thanked the company for the toast, and Messrs. Bewick and partners for their kindly and hospitable reception that day. The President then proposed "The Health of Messrs. Bewick and partners." He said he had one of old George Stephenson's speeches in his pocket, in which he advised them to keep well to the front and keep the traces tight; to advance every species of mechanical engineering in order to be in front in every respect. This Messrs. Bewick had done, as they had seen that day. (Applause.)

The CHAIRMAN, in reply, said but for the bad times the Langley Barony Mines could not have been an eminent success. He did not say it was not a success as it was; but if they had had lead at from 21s. to 24s. a ton, as it was when they started, instead of from 13s. 5s. to 15s., it would have been eminently successful.

Mr. W. COCHRANE submitted "The Lead Trade," to which Mr. A. LESLIE responded. The latter, speaking of his long connection with shipbuilding, said there were at the present time more than 50 vessels of his building carrying Her Majesty's mails.

Meetings of Public Companies.

BRASTBERG COPPER COMPANY.

The first ordinary general meeting of shareholders was held at the offices of the company, Austin Friars, on Friday, the 5th inst., Mr. J. H. MURCHISON, F.R.G.S., in the chair.

The notice convening the meeting was read.

The CHAIRMAN said—The notice convening the meeting having been read, I suppose the shareholders present will expect a few remarks with regard to the present position and future prospects of the company. Only a very short time has elapsed since the company was registered, and I suppose everybody knows by this time what a statutory general meeting (such as this is) means—namely, a meeting which it is necessary to call in accordance with the Act of Parliament, which requires that a general meeting of shareholders shall be held within four months of the time of the incorporation of the company. Gentlemen, the property which this company has acquired is not what in Cornish phraseology would be called a "knacked-bal." I don't know whether you know what a "knacked-bal" is, but in Cornwall it signifies an abandoned mine, though I think the word "knacked" has a little more signification, and would rather be applied to mines which have been tried, and perhaps found not to be of much value. I fear a good many people have lately discovered the meaning of a "knacked-bal," but, gentlemen, this company has acquired a going concern, and more than that we have acquired a going profitable concern, and while the mining operations had been going on the property itself has been going on improving very considerably. You would observe by the prospectus that the reports are dated nearly eight months ago. Now, I have heard some remarks about this, and one of the directors has informed me that some friends of his had thought that a most unfavourable feature. It was very true, they said, that the reports showed the property was a very good one at that date; but it was very curious that little or nothing was said about what had happened there since that time. Now, I am very glad to inform you that whatever was said of the mines eight months ago we can say at least four times as much for them to-day. (Hear, hear.) In the first place, I am happy to be able to bring before you independent testimony. About six weeks or two months ago we sent out from this country Mr. Loam, the well-known engineer, for the purpose of advising the company with reference to the erection of boring machinery, and, as a natural consequence, the putting up of more powerful winding machinery, because, of course, if you procure a much larger quantity of stuff, which boring machinery would enable you to, you must have more extensive means of bringing it to surface. Mr. Loam went out, and has since returned, and when I saw him his first expression was—"I am very much struck with the appearance of the mines, and I cannot understand how it was that such a property should have been sold." In the first place, I may say that when the property was sold it was not thought to be so good a one as it has since turned out to be; but Mr. Loam told me that before leaving for Norway he had written to an old friend of his asking him to accompany him, simply as a holiday. Mr. Loam's friend was a Cornishman, who had been connected with one of the most important mining concerns in this country for 30 years, and under his management that mine paid to the shareholders nearly three millions of profit, and when he retired from the concern the shareholders made him a present of 2000*l*. That shows you the position and professional character of the gentleman who accompanied Mr. Loam to Norway, and whose name I do not wish to mention publicly, as the report he sent me was rather for my private information than as a formal report.—[The Chairman then read some of the extracts from this report.]—This gentleman is so confident of the success of the mine that he has taken 100 shares since his return. Well, Mr. Loam, who, though he is a mechanical engineer and not a mining engineer, has been during the whole of his life—and he is not a young man now—associated with the largest mines in Cornwall and Devon and elsewhere as a mechanical engineer, has been largely interested in many of them personally, and knows as much as a great many mining captains about mining itself, he told me that in two places alone he had seen he valued the ore ground at 100,000*l*. Now these are the opinions of independent authorities. Perhaps you will now allow me to read a short report from Capt. Daw (who is present, and will be happy to answer any questions) as to the improved position of the mine with reference to the statements in the prospectus. Mr. York, one of the directors, returned to-day from the mines, and can tell you personally what he saw, and Mr. Lamb, who has been underground there, is also here. The report, which is dated July 15, states:—

I beg to inform you that Mr. York, one of the directors, has just visited the mines, and was well pleased with everything he saw. Since my report of Nov. 29, 1880, many good improvements have taken place in the mines, more especially in the Hoffnong lode. The No. 2 adit east has very much improved, the lode being fully 3 ft. wide, composed of quartz and rich copper ore; worth for the latter $\frac{1}{2}$ ton of 22 per cent., or over 20*l*. per fathom. As this is our most westerly point, and every fathom driven gives upwards of 80 fms. of backs, its importance cannot be over estimated. The lode in the No. 3 adit, 20 fms. below this point, and about 90 fms. to the east, is over 3 ft. wide, yielding 2 ton per fathom, or, in money value, 25*l*. About 50 fms. to the east of this shaft is being sunk, which is named York's; it is now about 40 fms. under the adit, the lode being over 4 ft. wide, and worth 3 tons, or 38*l*. per fathom. Also about 100 fms. to the east of this we are sinking another shaft, which has not yet been named; it is about 15 fms. under the No. 3, or lowest adit, the lode being fully 3 ft. wide; worth $\frac{1}{2}$ ton, or 20*l*. per fathom. In this piece of ground alone I value the copper ore discovered at over 100,000*l*.; and taken into consideration the large quantities of ore laid open by the workings already made, I do not hesitate to say we have a great deal more than 200,000*l*. worth of ore which can soon be made available for stopping after the proposed new machinery is erected. It is intended to erect two 30-horse power drawing engines to take the place of the present horse-whim, and also to drive our levels with boring machinery, the motive power being a 200-horse power turbine. We having a never failing supply of water of many thousand horse-power running close to the mines, which is a great advantage over steam, being a dividend in itself. When this is completed the profits will be very largely increased.

The CHAIRMAN then drew attention to some fine specimens which were exhibited at the meeting, and said that he hardly liked to refer to specimens when cargoes were coming over. He continued: So much for the mines. I do not know whether the shareholders sufficiently appreciate the fact that we acquire this property as a freehold.

Capt. DAW: We not only have the freehold of the mines, but of the surface also. That is very important, I think.—The CHAIRMAN: And more than that we have an abundance of timber. In mining in this country a great deal of timber has to be used underground, and that will be very important to us both for use underground and also in case we undertake the smelting of our ores. We have this timber for the mere cutting down; but still more important is the fact that we shall have no royalty or rent to pay.

A SHAREHOLDER: No any water rates. (Laughter.)—The CHAIRMAN: You acquire a going concern, and not merely a going concern on a small scale; but it is really in this position that it is making a good profit now, and as far as you can humanly speak for it certainly it is certain that for the first 12 months there will be a profit applicable for a dividend if that is decided to be done. It will take the first year perhaps to erect boring and new winding machinery, and then, of course, the returns and profits will be very largely increased. There will be no stoppage in any way to the works, and the new machinery can be erected without interfering in any way with what is going on now. Mr. Loam told me, and Capt. Daw can correct me if I am wrong, and has almost repeated it in his report, that "what you want is simply the money to pay for the mines and the money for the machinery, the estimate being between 5000*l*. and 6000*l*.; and I do not see that you want a farthing of working capital." He said afterwards you might have a thousand or two, but it is not absolutely necessary. But remember we have been talking of only one of the lodes, the Hoffnong lode. There are other lodes which some people think—I believe Capt. Daw thinks so—to be more valuable than Hoffnong. There is the lode of Nesmark, alluded to by this gentleman, who says it is a great feature before us. If the capital we receive in the first instance is more than sufficient, as no doubt it is, for what was contemplated in the original prospectus—when we did not know of the great improvements and discoveries that have taken place—if we have, as we shall have I may say, a considerable sum over and above the amount necessary for developing the Hoffnong lodes, we can apply that to the opening and work-

ing of Nesmark or any of the other mines. The property is a very extensive one, and there are other mines belonging to the company of very great importance. There is one, the Mosnap, a considerable distance from Hoffnong, and there is the Guldneis with a lode 103 ft. wide, with good copper ore all through it. That is the mine, I believe, where the former company spent 35,000*l*. in making roads and erecting machinery. They made 7 miles of roads there through a very heavy, hilly, country, so that the property will be more accessible than it otherwise would have been; but that is where 35,000*l*. of their money went. The Chairman then drew attention to some of the statements in Capt. Daw's report, and said he believed they would have capital enough to work more of the mines than it was thought they would be able to, and they would still have valuable properties to deal with, either by working them themselves, or forming a separate company to work them. (Applause.)

Mr. S. YORK fully endorsed the Chairman's statements with regard to the value of the properties, and said that he went to Norway feeling rather sceptical as to some of the descriptions given of the mines, but a visit to them and an inspection of the workings underground and at surface had convinced him that Capt. Daw had acted in a most straightforward manner in describing the properties, and he had not the slightest doubt with regard to the success of the company. Mr. YORK also referred to the ability and energy of Capt. Daw's sons who had charge of the mines in their father's absence, remarking that they were thoroughly and practically acquainted with every branch of their duties from mining underground to making assays of the minerals produced. He regarded his investment in the company as of a permanent character, and that it would produce dividends for generations to come. (Applause.)

Mr. H. W. LAMB said he visited the mines two years ago, and he could concur in all that had been said as to the value of the mines, and the ability and energy of Capt. Daw. One of the lodes he saw there was the richest copper lode he had ever seen in his life. Mr. Lamb added that Mr. York since visiting the mines had nearly doubled his holding in the company, which had now been increased to 800 shares. He also had a large holding in the company.

Capt. DAW remarked that the property was not one of to-day or to-morrow, but it would be a valuable property for their great grandchildren. They had courses of ore laid open for 250 fms. in length, continuing rich throughout, and gradually widening as the workings became deeper, from a few inches to from 4 to 6 ft. wide. They had already opened up fully 100,000*l*. worth of ore that men could be set to stop, and there was evidence of 250,000*l*. worth of ore opened on one lode alone. One of the lodes to the north averaged from 8 to 10 ft. wide, producing 22 per cent. of copper, and the Nesmark lode had produced a good many tons of copper ore, which they had sold at 50*l*. per ton, as it contained about 200 ozs. of silver to the ton. He had been working a small mine there for about three months in the year, and had had to bring the ores over the snow in winter, but it had given him a clear profit of 500*l*. a year. The property would yield the company a good dividend the first year, but a better one the second year, and a better one still the third year. At one of the mines—Guldneis—they had an engine and houses for manager, engineer, and 300 men, and here the lode was 10 ft. wide, with copper disseminated throughout it. The old company returned something like 40 tons of ore per month from this mine, and they employed 200 men, but they spent too much of their capital on this one mine, and thus got into difficulties, necessitating the sale of the property.

A SHAREHOLDER: How many men have you got on the mine now?—Capt. DAW: About 25 men underground, and they raise on an average about 60 tons a month.—The SHAREHOLDER: Do you purpose putting on more men directly? Capt. DAW: Certainly; many more.

Mr. YORK added that he saw on the floors from 500 tons to 800 tons of good ore.

The CHAIRMAN, in reply to a question said the company was entitled to the profits derived from the working of the mine from April 19 last. Mr. KERLEY added that they were now entitled to possession, and the necessary steps were in progress for that purpose.—Capt. DAW, in reply to a question, said they had ample water power for a property ten times the size of theirs. At present they had 200 horse-power, but they could as easily have 2000 horse-power. The CHAIRMAN remarked that the working could be continued all through the winter, and that was the best time for taking the machinery up and taking away the ore, as it could be sledged over the snow.

The meeting then closed with a cordial vote of thanks to the Chairman.

THE NORWAY COPPER MINES COMPANY.

The statutory general meeting of shareholders was held on Saturday, Aug. 6, at the offices of Messrs. Leslie, Kirby, Straith, and Co., the auditors, Coleman-street.

The Hon. ASHLEY PONSONBY in the chair.

Mr. G. S. MOULD (the secretary) having read the notice convening the meeting.

The CHAIRMAN remarked that this was the formal statutory meeting of the company, and that he had no resolution to propose except the declaration of the dividend to be paid upon the shares. He was happy to say that Mr. Boyd, the eminent mining engineer, was present, and would kindly read his report on the company's property. That gentleman had so recently returned from Norway that the directors have had no opportunity of seeing the report, but he (the Chairman) was certain it would be most interesting to the shareholders to hear it read, after which he would have a resolution to propose and a few remarks to make.

Mr. BOYD, F.G.S., F.R.G.S., then read his report, as follows:—

Aug. 4.—In accordance with your instructions I proceeded to Norway on July 24 to examine the mines of the Norway Copper Mines Company, and here-with beg to hand you my report. Without entering into the details, which are known to you, I may briefly refer to the position and extent of the mining property. The concessions are situated on two islands, named respectively Halsen and Radeen, about 15 miles from the town of Bergen, and on the track of the railway from the island of Halsen a distinct vein of quartz, containing specks of copper and iron pyrites, can be traced for several miles running in a north-east and south-westerly direction. On this vein at a point named Espetvedt, within about 100 yards of the water's edge, the shaft known as Adelaide has been sunk to a depth of 112 ft. on the vein; at a depth of 30 ft. from the surface the character of the vein becomes more defined, and the quartz contains an appreciable quantity of iron pyrites with some specks of copper. At this depth a level has been driven for a few yards. At the depth of 72 ft. I was able to examine the lode very satisfactorily. Its direction I found to be 43° east of north with an inclination of 65° to the west. On the west side of the lode a level has been driven 27 ft., and I traced the ore along the roof of this level from the shaft to the end, where I measured it and found 8 in. of good copper pyrites containing from 7 to 8 per cent. of metal. On the east side of the shaft a level has been driven 12 ft., and here I measured the vein of ore 20 in., at the shaft at 6 ft. distance, 18 in., and at the end 10 in. The general features of the vein are in my opinion very favourable. The matrix consists of quartz slightly discoloured from 2 ft. to 3 ft. in thickness, lying between well-defined walls, and running parallel with it can be traced on the surface. These will have to be proved by driving cross-cuts from the bottom at convenient points. The existence of these parallel beds is clearly seen at the Jordan Mines, situated on the opposite side of the Fjord where I could distinctly trace five small lodes of quartz containing specks of iron and copper pyrites. A small shaft has here been sunk down 7 fms., but it appears to me that the trial at this point has not been made on the main lode, but on one of the branches. I am of opinion that the main lode passes along a dislocation in the rocks, which may be seen a few yards north of the Jordan shaft; and which in direction corresponds to the continuation of the Adelaide shaft. Along this level I traced this lode several promising outcrops of pyrites have been broken into, and I believe the lode exists here as it does at the Adelaide Mine. I traced the course on this side of the Fjord for upwards of a mile.

Since my previous visit to these mines an adit level has been commenced from the shore. This is driven on the vein and intended to intersect the bottom of the Adelaide shaft. This adit is now driven 94 ft. in regular quartz vein shaft, bearing specks of copper from the mouth to the end. Judging from the indications on the surface I am of opinion that good mineral ground worth stopping will be found at a distance of from 100 ft. to 120 ft. from the present end. The appearance of the shaft in the adit strongly confirms my view as to the regularity and continuance of the vein. The result of my inspection is to confirm in every way my previous report as to the value and prospects of the mine. I may here again refer to the exceptionally favourable situation of the mine as regards shipment of ore and freights. It is seldom that mines are opened in such favourable situations. The Adelaide shaft is only 100 yards from the water's edge, where vessels of deep draught can be loaded. There is, therefore, practically no land-carriage, which is a very important point, considering how heavily most mines are hampered with in the cost of carriage of their produce to a shipping port. The freights to England are comparatively low, and to Newcastle the mineral can be conveyed by steamer for 6s. a ton. The climate is salubrious, and there is no want of labour at a cheap rate of wages. These are most important facts not to be lost sight of in considering the value and prospects of your property. There is at the present time a quantity of ore lying on bank which I estimate roughly at 150 tons, with a yield of about 8 per cent. of copper. A cargo of this ore was being prepared for shipment at the time of my visit. This result must be regarded as satisfactory, considering the small extent of the workings, and the shallow depth of the shaft. The entire length opened out, including all the levels in the shaft and the shaft itself, does not exceed 70 yards, so that in these surface workings the returns of ore has been at the rate of 2 tons, more or less, per lineal yard driven. The sale of the present shipment will show more exactly the value of the ground driven through, but considering that the ground broken is so near the surface this must be accepted as a minimum result. As already stated, mining operations are at present suspended in order to put the engine in place and fix the winding and pumping gear. I estimate that with fine weather the machinery, including the stone-breaker, will be in place, and ready for work in four weeks from Aug. 1. When the engine is at work I consider the quantity of from 40 to 50 tons of mineral ought to be raised per month from the drivings and sinkings only. When sufficient ground has been opened out to commence stopping a much larger quantity of ore will, of course, be raised. With regard to the mining operations to be carried on at once, I would recommend you to continue driving the adit level without interruption. This level will serve to unwater the mine to a certain depth; it will supply the needful ventilation when the shaft is sunk down lower, and will afford the earliest opportunity of opening shafts in the vein. In the meantime the machinery on the ground will be put in place and the shaft fitted up for drawing ore and pumping water. When the adit level has passed beyond the shaft bottom I should advise the dressing floors to be placed at the mouth of the level, and the whole work concentrated at this point. It is needless to state that the water necessary for dressing purposes can be pumped from the Fjord. For the present, and until the mine is giving substantial returns of ore, I would not advise any new works

to be opened on the property, but would restrict the operations to the development of the Adelaide Mine to begin with. This will entail but a small outlay of capital beyond the machinery, which is already paid for. I estimate the capital necessary to put the shaft in working order, sink it down 100 yards, drive the adit level another 200 yards, the 72 ft. level 150 yards, put up dressing floors, and incidental expenses, at 5000*l*. This work ought to be carried out within 12 months of present date; and if the vein answers to the present favourable indications now apparent a return of 150 to 200 tons of ore per month may be expected from the Adelaide Mine alone. Now, with reference to the statements made in the prospectus, I believe them to be generally correct. The favourable appearance of the lode, the extent of the concession, and the exceptional situation of the mine as regards facilities for shipment, justify, in my opinion, the value placed on the property and the expectations entertained as to its future. In conclusion, I have to state that I believe this mine, if properly developed, will give brilliant results, and I have no hesitation in recommending you to proceed vigorously with the projected work.—R. NELSON BOYD, F.R.G.S., F.G.S.

The CHAIRMAN then said that he was sure they were all obliged to Mr. Boyd for his interesting and able report, which they must all consider as most satisfactory. He thought it necessary to give a little explanation as to the reason why there had been some delay in getting the new machinery erected, and why the general operations had not been prosecuted as vigorously as would otherwise have been the case, and he thought he should be able to give the shareholders satisfactory explanations on these points. The chief reason of any delay that may have occurred was the difficulty that had been found in assimilating the laws of Norway and those of England on the exact reading of the Norwegian concessions. One point of the Norwegian law was that any person could take up a scarpesdille, or an agreement to take up, which had to be signed by a Government official and exposed at the church doors; this was something similar to our English tack note, which is well known to all mining men, and ranks from the date of signature, and gives a right to the property to the first holder for one year without interference; after this, however, to maintain the said right, a "Muthingbrev" must be applied for, which is granted subject to the law of mining, a condition of which law is that each division (nearly 1000 English feet) of the property must be worked every month; and the Chairman thought it was hardly necessary to point out that it may be inconvenient and not thought desirable to work some of these many divisions existing on the property, and he mentioned this because he thought it very probable they would have to come to the shareholders at a future time for their sanction; and that those portions of the property which might be found of no use to the shareholders should be disposed of either by sale or otherwise abandoned, as may be thought best, and to amend the wording of the prospectus accordingly.

[Here the Chairman referring to a map of the property, which was exhibited to enable those present to follow the remarks, said that it would be obvious to the meeting that it could not be in the interests of the shareholders to work at one time all the 16 divisions of concessions, and that the points they were now working were very convenient for shipping the ore direct into vessels, as pointed out in Mr. Boyd's report, thus saving cost of land carriage, &c. This of course could not be said of the concessions which may be opened further inland, and because of the expense of conveying the ore across country which was mountainous, it would be most unlikely that anyone would endeavour to compete with the company who hold the seaboard at each side open if the company were to allow any of the 16 rights to lapse, which of course would not in any case be done without consulting the shareholders and in view of their interests.]

The CHAIRMAN further mentioned that the Government official whose duty it was to measure out the exact boundary of the concessions would do so at his next visit, and possibly measure out the whole of the property in one grant to the company from sea to sea. This was, the Chairman explained, often done in such cases, though the directors did not in any way rely upon it; indeed it did not matter whether or not it was done, as in any case the company had sufficient ground for development for this and the coming generation. The Chairman concluded his remarks by inviting any remarks from the shareholders present, and proposing a resolution that instructions to the trustees be given to pay the preference dividend on the paid up capital of the company at the rate of 10 per cent. per annum up to the 30th of June and the 31st of December, or on before the 12th day of August, 1881, and the 10th day of January, 1882, adding that they might have run over the first six months, but they (the directors) considered it better to take June and December as the future date for settling the accounts.

Mr. DEANE seconded the resolution, which was agreed to unanimously.

A cordial vote of thanks to the Chairman and directors closed the proceedings.

ENGLISH AND AUSTRALIAN COPPER COMPANY.

The half-yearly general meeting of shareholders was held at the Cannon-street Hotel on Thursday.

Mr. R. A. ROUTH, the Chairman, presiding.

Mr. C. B. ROGERS (the secretary) read the notice calling the meeting. The statement presented was as follows:—

At the present half-yearly meeting of proprietors the directors have to lay before them a statement of the proceedings of the company for the six months ending Dec. 31, 1880. During that period the gross quantity of ore, regulus, and precipitate received from various mines was 3938 tons 2 cwt. 2 qrs., as against 6235 tons 12 cwt. for the corresponding six months of the previous year. The quantity of ore, regulus, and precipitate smelted at Port Adelaide and Newcastle Works was 3827 tons 11 cwt. 2 qrs., as against 5186 tons 5 cwt. 1 qr. 11 lbs.; and the quantity of copper shipped from and sold in Australia was 681 tons 1 cwt. 9 lbs., as against 889 tons 2 cwt. 16 lbs. The net earnings of the company's wharf at Port Adelaide were 1342*l*. 10*s*. 7*d*., as against 1510*l*. 15*s*. 11*d*. for the corresponding half-year. At the time of the general meeting, held on Feb. 19 this year, the price of Burra Burra copper was 69*s*. per ton; it is now quoted at 65*s*. 10*s*. per ton. The statement of six months' working to Dec. 31, 1880, shows an estimated profit of 229*l*. 1*s*. 2*d*. The reserve fund stands at 8733*l*. 16*s*. 9*d*.

The CHAIRMAN said this was not the annual general meeting at which the directors presented full accounts, or at which they discussed all the more important matters with regard to the company, but the statement now laid before the shareholders was similar to that which had been presented for some years past at the request of the shareholders, with the view of showing the working of the company for the six months. It should also (which it did not on this occasion) show a profit sufficient to enable an interim dividend to be declared. He was sorry to say that the profits on the six months' working were not sufficient to justify the declaration of a dividend. He would show them the work which had been done during the six months. He would also tell them what he thought of the working of the whole year, and when they met in February he should be able to put before them a statement of the working of the year. On this occasion the gross quantity of ore, regulus, and precipitate received from the various mines was 3992 tons 2 cwt. 2 qrs., as against 6635 tons 12 cwt. for the corresponding six months of the previous year. The quantity of ore, regulus, and precipitate smelted at Port Adelaide and Newcastle Works was 3827 tons 11 cwt. 2 qrs., as against 5186 tons 5 cwt. 1 qr. 11 lbs.; the quantity of copper made was 685 tons 18 cwt. 3 qrs. 2 lbs., as against 885 tons 5 cwt. 1 qr. 11 lbs.; and the quantity of copper shipped from and sold in Australia was 681 tons 1 cwt. 9 lbs., as against 889 tons 2 cwt. 16 lbs. The net earnings of the company's wharf at Port Adelaide were 1342*l*. 10*s*. 7*d*., as against 1510*l*. 15*s*. 11*d*. for the corresponding half-year. The question was what the result was attributable to? The first point he would call their attention to was the short supply of ore which had been received; the second would be with respect to the fall in the price of copper; and the third (which really came out of the first) was that they had to reduce the valuation of their stocks in hand in order to meet the present price of copper. This was one of the reasons which caused great fluctuations in this company. Some few years ago the directors could declare a dividend of 2*s*. 6*d*. per share, whereas the dividend for February last was reduced to 1*s*. per share; but from his knowledge of the copper market, and knowing also the energy of the board, he had no hesitation in saying that a return to prosperous times was not so far distant as some people seemed to imagine. (Hear, hear.) He did not wish to make any political reference, but he could not help remarking that in this company they had to cope with Free Trade without any reciprocity. One of their best markets, America, with sixty million of inhabitants, had been cut from under their feet, simply because the American Government had fixed an *ad valorem* duty on all copper going into that country of 50 per cent., so although the company could get 15*s*. per ton more for their copper, they could not send it because of the high protective duty. It was not only with respect to copper, but there had also been during the past 12 months a decline in the price of all the leading commodities. Pig-iron was now 47*s*. per ton compared with 55*s*. 6*d*.; Staffordshire bars, 6*s*. 7*d*., compared with 7*s*. 7*d*. 10*s*.; lead, 15*s*. 5*d*., as compared with 16*s*. 10*s*.; tin, 90*s*, compared with 92*s*. They were also against 127*s*. against 127*s*. The same with the case of many other articles, all of which showed that England, as a producing country, should be met by other countries on fair and legitimate terms. Why was it that copper was 4*s*. 10*s*. less this meeting than at last; simply because there had been thrown back upon this country large quantities of copper which would have been absorbed by America and other countries if we had fair and legitimate play. With respect to this company's own manufactures, at the last meeting he shadowed forth that the great difficulty of the company was first of all in getting the ore, as the price had fallen so low that the mines would not raise the ore at all for the smelters. If the price were better there would be larger quantities of ore brought to the company to treat; the difference in the half-year now under consideration was 3900 tons, against 6225 tons, showing they had had scarcely half the furnaces at work. In former times they considered 6000 tons in the half-year a moderate quantity to work upon. In consequence of not being able to get from the home mines the quantity of ore required. Some ore had been brought from New Zealand, and in fact they had been put to right and left to keep the furnaces alight at all. One great thing in connection with copper smelting was a full and proper supply of ore; and although they were now passing through a period of very considerable difficulty, yet he was glad to tell them that the supply of ore which he had been longing for for some years, and which he referred to at the last meeting, seemed likely now to be coming forward. At the time of his last meeting

there was on the taps in the City of London a company which would open out new ore for this company, to be called the Corporation of South Australian Copper Mines. This had now been formed with a capital of 250,000*l*. This was established for the purpose of opening up the northern mines, which should give large supplies of ore to this company. He then read a letter from the manager on the other side. The fact was that the first time they found they had 8000 tons of ore which they would be able to get down to the smelting works, and this was merely the precursor of opening up the northern mines. The northern district was about the size of Cornwall, and from these mines alone it was considered that this company would get 12,000 tons a year. No doubt other companies would be formed under this company, which would also supply ore, and the contract compelled all those companies to give their ore to this company. Therefore, when those new mines were opened up the complaints about the difficulty of getting ore would be entirely done away with. Then came the question as to whether they could smelt at a profit. These mines were something like 400 miles from Adelaide and 200 from Port Augusta, but the Government had made a railway running up to this spot. A portion of that railway was now open to Beltana, more than half the distance, and within twelve months it would be opened up the whole distance; then these ores which it cost 10*s*. per ton to bring down could be brought down for 30*s*. per ton. Never during the whole of the time that he had been chairman had the prospects of the ore from the northern sources been so satisfactory. He went on to point out that when there was a constant supply of ore it does away with the difficulty which the directors often experienced from not having a regular stock of copper, and they would not have to submit to the fall in price to the same extent they now did. Looking at all these circumstances he expressed the hope that when they met again in February they would see a considerable advance in the position of the company. There was no resolution to submit, and after a short discussion of no public interest the proceedings closed with a vote of thanks to the Chairman and directors.

SORTRIDGE COPPER MINING COMPANY.

A general meeting of shareholders was held at the offices of the company, Austin Friars, on Monday.

Mr. J. H. MURCHISON F.R.G.S., in the chair.

Mr. C. HARRISON SMITH (the secretary) read the notice calling the meeting, also the following report from Capt. Skewis:—

Aug. 6.—The engine-shaft has been uncovered and put in thorough repair from surface to the 30; also footway and skip road have been put in good repair to this level. Three lodes have been intersected at the 30 cross-cut north from the shaft, and a good deal of work done on the No. 2 lode, both east and west, by the late company. To the westward, however, there is a long run of ground unworked, and from which I have broken some very fine stones of copper ore. No. 1 lode being poor at this point where intersected, I have put men about 40 fms. west to cross-cut it again, with the hope of finding it good. I have also had the shaft, which is on the great north tin lode, opened so as to enable me to examine the lode, from which I broke some very fine stones of tin. A new horse-wheel is made and erected between this shaft and the engine-shaft, so as to draw water from both shafts. The deep shaft is cleared of all the chokage, and a small shaft sunk on it, so that I may now be able to sink and let down the water with safety to the men, &c. Cripers' shaft is sunk 15 fms. through a very large and strong lode, which at times has yielded some good stones of copper ore. The tin lode in the western part is a fine looking one, and such as I believe will turn out well, and according to my view no time should be lost in erecting stamping power, the cost of which will be about 1200*l*. By the time this is done you will have a large quantity of tin stuff ready to stamp. From all appearances I have reason to believe that in addition to copper we have a good tin mining property.—Wm. SKEWIS.

The CHAIRMAN said it would be seen that in addition to copper they had also a good tin mining property. The directors had also received a good report from Capt. Daw, who had inspected the property, and he would ask the secretary to read it.

The SECRETARY read the report of Capt. Daw, as follows:—

Mary Tivy, Devon, Aug. 5.—In company with your manager, Capt. W. Skewis, and Mr. Cripers, the purser, I inspected the Sortridge Mine on Monday last. The situation and past history of the property being so well known to you, it is unnecessary for me to make any observations on the subject. We first visited the deep adit, which is being cleared to unwater the mine to the 60 fm. level, and as far as I can judge this work will take about two months to complete. I will now call your attention to the copper lode. A shaft named Cripers has been sunk to the west of the cross-course, and is now down some fathoms. The lode in the bottom is 4 ft. wide, composed of gossan, muncie, and rich stones of copper ore. Considerable depth of lode is shown, but the true east meeting costs are not yet reached. The lode is rich, and I have no doubt as you go deeper it will increase in richness. At the 30 fm. level from surface a cross-cut is being driven, which Capt. Skewis fully anticipates will in 2 or 3 fms. intersect the main copper lode west of the engine-shaft. I consider this work to be of the utmost importance, and shall watch its progress with great interest, as any day it may open up a rich course of copper ore. We next went to the great, or No. 1 tin lode. A shaft, which is now standing, has been sunk here about 7 fms. The lode is from 10 to 12 ft. wide, and the appearance most promising. Samples taken gave a produce of 48 lbs. of black tin to the ton of stuff, as broken from the lode. Assuming the present price of tin to be 56*s*. a ton the value of this lode is about 48*s*. a fathom, which I need hardly say is most satisfactory; but suppose we reduce this by one-third, and call it 32*s*. per fathom, we then have a tin lode equal to a copper lode producing 4 tons to the fathom, worth 8*s*. per ton. There are two other tin lodes to the south of the above, which a short cross-cut would reach, and it is my belief they will be found to be as rich as the No. 1. The great or No. 1 tin lode, being in itself a rich mine, I have no hesitation in recommending you to at once put up the necessary machinery to enable you to make marketable the ore. The lode having only been sunk upon at the tin shaft to a depth of 7 fms. it might be considered that I was over-anguine as to its continued productiveness; but in view of the fact that it has been reached by a cross-cut from the copper lode at the 30 fm. level some considerable distance to the east of the tin shaft, and found to be as rich, if not more so, than in the shaft, I think I am fully justified in anticipating that from this source alone we may confidently expect permanent and profitable returns. As you are aware I am already interested as a shareholder in the success of the concern, and so satisfied am I with the present appearance of the mine that I shall double my interest if my suggestions are immediately carried out, and proper machinery is erected for driving and returning the ore we have already discovered, and after three or four months time I have no doubt we shall be at least meeting costs and progressing rapidly towards a dividend-paying position. There is a never-failing supply of water on the property, more than ample for all purposes, and by availing ourselves of this Capt. Skewis and myself are of opinion that 1000*l*. would enable us to erect machinery sufficient to make regular returns. There is a good road to the railway station, a mile distant, consequently the cost of carriage would be very small.—JOHN DAW.

The CHAIRMAN said he thought the above two reports pretty well spoke for themselves, and there were many gentlemen present who understood them quite as well as he did. The directors had been anxious to have as many shareholders as possible present at this meeting, because they knew the *prestige* of this mine with respect to copper, and they had been rather excluding tin—in fact, the old company never touched the tin lodes. The present company were finding out that some of these tin lodes were very rich, and capable of making good and profitable returns. With regard to the samples which had been taken, he might mention that two samples were taken by two different people, and they were taken from about 10 tons, which made it all the more important. According to the assay the lode would be worth 48 lbs. per ton of stuff, or (say) 48*s*. per fathom, but in making his estimate Capt. Daw had reduced it to 32*s*. Capt. Skewis was pressing upon the board that if they got a rich tin mine it was more important than assuming a rich copper mine afterwards. Captain Skewis was pressing the directors to erect machinery to produce the tin, and in answer he said that the more he saw of the mine the more strongly he was convinced it could prove to be a large and profitable one even for copper alone, and for which the company commenced their research. In addition to this, however, he found in course of operations that there was a large quantity of profitable tin ground available, and he was of the opinion that as the work went forward equally good discoveries would be made for tin as for copper. Therefore, he considered that the workings hitherto carried on had only been preliminary to those required for the opening up of a great property. What the directors really wanted to know was as to what was the view of the shareholders generally, and whether they would recommend the directors to go to the expense of erecting the machinery and returning the tin. He believed everybody considered that a bird in the hand was worth two in the bush. There was a tin mine which, according to the reports, was really good, and was ready to make actual returns, and it was for the shareholders to consider whether, whilst pushing on the working for copper, they should not also set to work vigorously and make returns of tin from the discoveries to which he had referred. (Hear, hear.) Capt. Daw would answer any questions, and he should be glad to hear any suggestions regarding the best plan to be adopted. The directors were decidedly of opinion that the machinery should be erected at once to make the returns. (Hear, hear.) Two of the directors proposed going down at once to the works to make the necessary arrangements. There was another important point. The western ground was not included in the grant, and the old company did not work close to Mr. Spry's house. The directors had some little difficulty in getting Mr. Spry to allow mining near his house, but he at last consented to give this company the option for one year of taking that grant on payment of 1000*l*. The directors were of opinion that 1000*l*. spent on the property at present could do much more for the tin than the machinery could. Capt. Daw was of opinion that if this were done in the course of a short time the company would be able to pay that 1000*l*. out of profits. Mr. Spry, at the request of the directors, had agreed to defer the payment of the 1000*l*. on condition that the company would take the ground at once and spend 1000*l*. in the erection of machinery.

The CHAIRMAN said that they were driving to go in under the gossan shaft from the old 30 fm. level.

Capt. Daw spoke in high terms of the value and promising appearance of the tin lodes to which the Chairman had referred, and strongly recommended that the machinery should be erected and the returns of tin made as soon as possible.

In reply to a question, the CHAIRMAN said the royalty on the tin would be the same as on the copper—namely, 1-30th and then 1-20th.

Mr. WARD: Have we a sufficient amount of tin discovered to justify the expenditure of 1000*l*.?—Capt. Daw: Certainly we have. There is a great deal of tin discovered. There is not only No. 1 lode but Nos. 2 and 3 lodes.

In reply to a question, Capt. Daw said there was five times as much ore as would supply the stamps. The shaft was sinking on the course of the tin, worth about 100*s*. per fathom. The lode was about 12 ft. wide.

A desultory conversation ensued, in the course of which Mr. WARD, Mr. RISLEY, and other gentlemen expressed their strong concurrence with the views of the directors and Capt. Skewis and Daw, that 1000*l*. should at once be expended in the construction of machinery, so as to develop the tin ground as rapidly as possible. Some little doubt existed as to the exact terms of Mr.

Spry's offer, but it was stated that this would easily be cleared up by Mr. Petherick and Mr. Strachan, two of the directors, who were deputed to proceed forthwith to the mine and make all necessary arrangements.

The CHAIRMAN: I would remind you that we have no dues to pay till we sell 60,000*l*. worth of ore, and then the rate will be 1-20th.

On the motion of Mr. W. WARD, seconded by Mr. GUTTERICK, the following resolution was passed:—That the directors be requested to make such arrangements as they may deem expedient for working the tin lodes, including the acquiring of the western ground from Mr. Spry.

Capt. Daw said that Mr. Charles Thomas, who had a most intimate acquaintance with the tin lodes of the district, had expressed a high opinion of the tin deposits. He might mention that it was intended to keep men on the copper workings.—A vote of thanks to the Chairman closed the proceedings.

SOUTH WALES RAILWAY-WAGON COMPANY.

The forty-first half-yearly meeting of shareholders was held at the Royal Insurance Buildings, Corn-street, Bristol, on Aug. 5, Colonel SAVILLE, Chairman of the board of directors, presiding. In their report the directors recommended a dividend at the rate of 10 per cent. per annum, and stated that the rolling stock of the company consisted of 10,086 wagons and carriages, and four locomotives.

The CHAIRMAN, in moving that the report be received and adopted, said the directors had decided to recommend a dividend of 10 per cent. It was just 18 years since the company first declared a dividend of 10 per cent., and it had never, during the interval, paid a less dividend than that. They would observe that the balance was large enough to have paid a substantial bonus in addition to the 10 per cent. dividend, but he thought the shareholders would give the directors credit for doing wisely in adding large sums to the reserves. He had pleasure in moving the adoption of the report.—Mr. T. GIBSON seconded the motion, which was carried unanimously.

The CHAIRMAN next moved that the sum of 150*l*. be placed to the credit of the contingent fund account, and 250*l*. to the credit of the depreciation fund account. He might say that the contingent fund account was now larger than it had ever been before, but he did not think it was a penny too large for their business, and, therefore, he was quite sure it was a wise recommendation on the part of the directors to add 150*l*. to the fund this half-year. The depreciation fund was, he thought, in such a satisfactory state that he hoped by the next half-year they would not be compelled to recommend the application of anything to the fund.—Mr. B. S. STOCK seconded the resolution.

The CHAIRMAN moved that the retiring director, Mr. Joseph Haynes Nash, be re-elected a director of the company. He could assure the meeting that Mr. Nash's services as a director were most valuable.—Mr. MORRIS seconded the resolution.

The CHAIRMAN moved the re-election of Mr. Henry Brittan, the other retiring director.—Mr. OLDFIELD seconded the resolution.

The auditors of the company, Messrs. W. F. Brookman, and E. G. Clarke, were next re-elected, and the business of the meeting concluded.

PENHALE AND BARTON UNITED MINES.

The statutory meeting of shareholders was held at the offices of the company, Cannon-street, on Tuesday.

Mr. R. A. RIDDELL, M.A., in the chair.

The SECRETARY having read the notice convening the meeting,

The CHAIRMAN said—Gentlemen, I presume you are aware that this meeting has been convened in compliance with the Companies' Amendment Act, which requires a meeting of shareholders to be held within four months from the date of registration. Now, we were registered as a company on April 14 last, and have, therefore, entered the fourth month of our corporate existence, but we deemed it prudent to delay convening a meeting at an earlier date for reasons that will hereafter appear. And, gentlemen, as we are now assembled, permit me to assure you that the directors have much pleasure in meeting you for the first time, not only because we are all partners in the same undertaking, but also because they entertain a well-founded conviction that the capital you have embarked in it will prove to be eminently remunerative. We are in possession of an extensive mining property, which has long had the reputation of being the best in the St. Columb district. It consists of two mines, adjoining each other, and formerly worked by two distinct companies; but being now united will henceforth be conducted as one concern.

The Penhale Mine, which constitutes the southern portion of the property, occupies about 100 acres of land, and the Barton Mine, or northern portion, extends over 200 acres. The united mines are three-quarters of a mile in length from east to west, and they contain no less than eight well-defined and masterly lodes running from east to west through the whole extent of the property, and all productive of tin, with occasional large runs of copper ore. There are also two elvan courses traversing the mines from east to west; that in the Barton averaging 9 fms., or 54 ft., in width, forming one of the finest and most beautiful courses in Cornwall, the other running through Penhale in a direction nearly parallel to the former, but being only about one-third or one-fourth the width of the larger elvan. The two courses consist of decayed porphyry and felspar, arising from the fissures of felspathic granite, upon which the greater portion of Cornwall is based. Wherever such elvans appear they are indicative of great richness in the lodes which accompany them in the same direction in the same mine or neighbourhood. The larger elvan is attended by two fine lodes, one on each side of it, and the former adventurers, finding them extremely rich and productive, confined their operations almost exclusively to them, and raised large quantities of copper as well as tin ore from both lodes, the produce of which realized high prices at the Truro Ticketings. The lodes were worked to the 30, nor for any great distance, but it would appear that, encouraged by their success, the former workers sunk the engine-shaft 60 fms., and another to 50, with the view of commencing operations at the richest portion of the mine. After this, as I am informed, some dispute arose between the parties, whose interests it would appear were not identical, and as they could not settle their differences the engine was stopped, the mine became filled with water, and the undertaking was ultimately abandoned. But the Barton Mine is not merely rich in these two elvan lodes. In recently driving a distance of 80 fathoms parallel to the former, but being only about one-third or one-fourth the width of the larger elvan, the two courses consist of decayed porphyry and felspar, arising from the fissures of felspathic granite, upon which the greater portion of Cornwall is based. Wherever such elvans appear they are indicative of great richness in the lodes which accompany them in the same direction in the same mine or neighbourhood. 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level in Penhale Mine and from No. 1 lode in Barton were examined by the shareholders. Capt. EVANS stating that they contained upwards of 50 per cent. of tin. Several questions were also asked by different shareholders as to when ore would be ready for sale, as to the time it would take to completely clear the mine of water, and other matters, which were very satisfactorily answered by Capt. Evans or the Chairman, who pointed out the advantageous situation of the property, being near St. Columb-road Station, which is only six miles by rail or road from the shipping port of New Quay on the Bristol Channel; and, as an illustration of this, informed the meeting that about 10 days ago a ship from South Wales laden with coal offered half the cargo—about 100 tons—to the company, which they purchased on advantageous terms, and also bought 78 tons more at the same rate, the whole to be delivered free at the St. Columb-road Station, which had been done.

The CHAIRMAN, in answer to another question, explained that the working expenses would be much lighter in this mine than in most others, as no powder or dynamite would be required in getting at the ore, the "country," as the miners say, being sand, or a sandy soil, and, therefore, there would be no rock to bore and blast. This formed an important feature in saving expense, and the work would be done in one-fourth of the usual time.

No other question being asked the meeting closed with a cordial vote of thanks to the Chairman.

SOUTH CONDURROW MINING COMPANY.

The ordinary general meeting of shareholders was held at the offices, Austin Friars, on Wednesday,

Mr. H. J. MARSHALL in the chair.

Mr. J. HICKEY (the secretary) read the notice convening the meeting and the minutes of the preceding meeting, which were confirmed. The accounts for the 16 weeks, charging the costs to July, showed that the expenditure had amounted to 6899l. 3s. 1d., including 220l. for an engine and boiler purchased from West Chiverton, and the tin sold, 152 tons, had realised 8413l. 12s. 4d., or an average of 55l. 7s. 11d. per ton. The copper sold realised 136l. 0s. 6d., and the profit shown was 1713l. 18s. 1d., raising the credit balance to 3758l. 5s. 6d.

The SECRETARY then read the following report from Capt. Rich:—
July 9.—During the past 16 weeks, or since your last general meeting, we have been urging on the different points of operation underground as well as forcing on the new works in the western part of the property. We have a good second-hand 25 in. cylinder winding engine with boiler delivered on the mine, a new and substantial engine-house has been built, and we shall soon begin to fix the engine spoken of. In the 93 end, east of King's shaft, the lode is of good size, and carries native copper, but little or no tin to value. The lode in the back of this level is worth 15l. per fathom for tin, and a lode in the bottom is worth 12l. per fathom. The 80 end east is suspended for the time, and the men set to sink in the bottom of this level in a lode worth 12l. per fathom. The 80 end, east of Plantation shaft, is worth 12l. per fathom, and a lode in the back behind this end is worth 12l. per fathom. Two stopes west of shaft are worth 10l. and 12l. per fathom respectively. The 70 end, east of King's shaft, is worth 6l. per fathom; the lode in this end has a strong and kindly appearance. We are urging on the 70 cross-cut south; this cross-cut is to the west of Plantation shaft, and is being put out to intersect Marshall's lode in the new western ground. It has been extended south of the tin lode 75 fms. We hope to intersect Marshall's lode in a month or two from this time. If this lode is cut good, as we hope it will be, we shall have nearly 100 fms. overhead high and dry to operate on. The lode in the back of the 60, west of Plantation shaft, is worth 15l. per fathom. We have put down a trial winze below the 60, east of this shaft, on a north lode; there is water in the bottom of this winze which prevents the sinking deeper. We are now stopping the lode east and west of this winze, which is worth 8l. per fathom. In the meantime we are putting out a cross-cut north at a deeper level with the view to intersect the lode and to drain the winze referred to. The lode in the 50 end, east of King's, is worth 12l. per fathom. There are two stopes in the back of this level worth 12l. per fathom each. We have taken the men from the 40 fm. level end east, for the time, and put them to enlarge, retimber, and secure the level east of King's during the dry season of the year. The stope in the back of the 40 east is worth 10l. per fathom. Marshall's shaft is in full course of sinking below the 30. We have sunk a winze and put up a rise in the back of the 40 towards this shaft, and we hope to communicate these points in a week or two. As soon as this shaft is made the full size to the 40 we shall fix a double skip-road to facilitate the discharge of the stuff, and for the rapid development of this part of the mine. We have driven a 40, west of mine, about 12 fms. on Marshall's lode; it has been worth 11l. per fathom. This is a profitable lode, as it is in easy ground. We do not intend to stop any of this tin ground till the shaft is made complete to the 40. Taking into consideration the profitable ground that is being opened out in this new part of the mine at the 40, and looking at the cross-cut that is being urged on the 70 to intersect the lode some 50 or 60 fms. deeper than the 40, we think the prospects in the new mine to the west are very cheering. In addition to this we are urging on the opening out of the main tin lode throughout the mine generally.—WM. RICH, WM. WILLIAMS, HUMPHREY KING.

Capt. RICH, in reply to a question, said they had made as much progress as was expected when they last met. In a month or two they would cut the lode in the 40 end. The lode in the 40 end was now being operated was easy to drive, and worth about 11l. per fathom, and he believed that as they approached the Wheal Grenville boundary they would have a very good lode. It would take a month or two to get the engine which had lately been purchased into good working order.

The CHAIRMAN said: You have heard Capt. Rich's report and the financial statement. You will have observed that we have sold a little more tin during this 16 weeks, to wit 7 tons, and the price has been about the same. We have earned in the shape of profit in 16 weeks, 1713l. During that 16 weeks we have spent and charged in the cost sheets on what might fairly be called capital account 220l. for the engine as it stood, 30l., or thereabouts—perhaps 40l.—for taking that engine down and bringing it on to the ground, and 20l. for repairing the boiler which was bought with the engine, making a total of 270l. for materials which are available to sell, which are in fact realisable assets. Taking the gross amount of money spent on that western ground during the 16 weeks I find that it amounts to 870l. Now I mention that that the adventurers may understand that they are opening up a new mine without paying calls, and they must consider that in assessing the value of their old mine as a dividend producing property that really 700l. of the money earned by old South Condurrow has been spent during the 16 weeks in developing what we may call new South Condurrow. I am speaking now really on the subject of dividend, and I have said that 1713l. has been earned. The matter before you is to decide what dividend should be declared, and these are matters which I think you should fairly take into consideration before you decide. The amount required to pay a 5s. dividend is 1530l. 15s., and the amount required for a 6s. dividend is 1836l. The committee recommend that you should declare a 6s. dividend, which would necessitate your taking 133l. 12s. from the balance in hand, instead of declaring a 5s. dividend and adding 170l. to the balance in hand; thinking it nothing but fair to the present adventurers to spread the 170l. to a certain extent over a greater length of time than the 16 weeks in which it has been spent, and the amount still likely to be called for to start the engine, which is a large one, and a more powerful one than is required for this shaft only; but it will draw also for the other shaft further west which will have to be sunk at a future time. This amount is about 460l., so that you may say that the total expenditure upon that engine and its accessories will be something like 730l. or 750l., and we propose to declare a 6s. dividend, and to charge the balance with one-fifth of that amount. He (the Chairman) then moved the declaration of a dividend of 6s. per share.

Mr. LEACH seconded the motion, which was carried unanimously.—Mr. LEACH proposed the adoption of the accounts and the agents' report.—Mr. MACKAY seconded the proposition, which was carried, and the committee of management were re-elected.

On the motion of Mr. LEACH a cordial vote of thanks was passed to the Chairman; and on the motion of Capt. RICH, seconded by Mr. LEWIS, a similar compliment was paid to Capt. Rich, who in returning thanks referred to the favourable prospects of the western part of the mine, and said that the old mine had yielded 50,000l. in profits during the time of depression.—The meeting then closed.

EAST POOL.—At the quarterly meeting, on Monday, the accounts showed a credit balance of 8864l. 18s. 7d. The committee proposed to pay a dividend of 20s. per share, which would absorb 6400l., leaving 2464l. 18s. 7d. to be carried forward to the next account.—In reply to Mr. W. H. Rule, who put a question in reference to the sale of wolfram, Mr. Martin, the purser, stated that their idea was to get a higher price for it. They had sold a small lot—about 5 tons—and they had now received an enquiry from a firm in Glasgow asking for wolfram in large quantities if they could guarantee a certain proportion of tungstic acid in it. This they could not do. They had not succeeded in selling any large quantities of it, but they had had some offers from different parties, and they hoped soon to effect a sale that would be beneficial to the shareholders. Many years ago a statement was made that they had a very large stock of wolfram in their heap, and it was computed that if it was dressed they would have some hundreds of tons there, as well as a little tin. They still had this to sell, and if ever there was a demand for it, and they sold at a good price, the shareholders would participate in the profits.—The Chairman said they were making preparations to work boring machinery in another part of the mine—sufficient for six borers, at least.—The purser stated that, touching the quantity of stuff drawn through the shaft, efforts were being made to improve their skip-road, so that they might have increased drawing power—perhaps one-third more.—In reply to Mr. Rule, Capt. Maynard said they had always had more stuff discovered than they had taken away. They always had plenty of stuff behind to work upon.

THE MINERAL WEALTH OF NEW SOUTH WALES.—In concluding an elaborate and interesting report upon the returns and value of the minerals raised in the colony—Mines and Mineral Statistics: Annual Report of the Department of Mines, New South Wales, for the year 1880—Mr. Harrie Wood, Under-Secretary for Mines, gives a careful summary, showing that to the end of last year no less than 52,714,317l. worth of minerals had been raised. During 1880 the output was—gold, 118,600½ ozs., value 4441,543l.; silver, 91,419 ozs., value 21,878l.; coal, 1,466,180 tons, value 625,337l.; shale, 19,201 tons, value 44,725l.; tin ingots, 5476½ tons; tin ore, 682½ tons; value together, 471,337l.; copper ingots, 5262½ tons; ore and regulus, 132 tons; value together, 364,059l.; iron, 2322½ tons, value 1535l.; antimony 86½ tons, metal, 12½ tons, value together 1652l.; lead, 27½ tons; value, 890l.; asbestos exported, 12½ tons, of the value of 323l.; and mixed minerals 21 tons, of the value of 795l. Mr. John

Mackenzie, F.G.S., the Government Examiner of Coal Fields, reports that there were 43 collieries under inspection, and opening out in 1880, against 37 in the preceding year. There was a decrease in the round and small coal raised of 117,612 tons and 302,243l. 11s. 6d. in the northern district, and of 26,807 tons and 40,552l. in the southern district, but an increase of 26,929 tons and 17,108l. 6s. 9d. in the western district. The entire volume, which can be obtained of Messrs. Trübner, Ludgate Hill, is of great value for the large amount of information contained.

COLORADO MINING REGION—SAN JUAN MINING DISTRICT.—The district here referred to has frequently been mentioned in the *Mining Journal* as the most important mining region in America; and as many British capitalists are interested in it, the publication of geographical and geological maps by Messrs. G. H. Adams and Son, of Deekman-street, New York, will be generally appreciated. In addition to the necessary information concerning the camps, post-offices, reduction works, mining districts, the maps give the new local names of towns, mountains, and gulches in all the mining camps, including Durango, Rico, and the new county of Dolores, the new railroads and railroad town, also the proposed railroads, wagon-roads, and other routes of travel. The elevations of the mountains and towns above sea level are also shown, and there is an excellent key-map, showing the whole State of Colorado. The map is well coloured and neatly mounted, in pocket form, or for office use as required.

POETICAL PORTRAITS.—The attractive little volumes of poems, by the Rev. Professor Bradshaw, of New Malden, Surrey—"Tears and Rainbows," and the "Gossiping Tongue"—have already been noticed in the *Journal*, and it may safely be said that all who have read them will be glad to learn that he has now in the press another volume, which, to judge from the titles of the poems, and the specimens given, will be equally attractive—"Hallowed Forms" and "Imperishable Images; or, Poetical Portraits of the Good, the Gifted, the True, the Tender, the Brave, and the Beautiful"—and from the wide range of subjects selected will suit the various tastes, and at the same time serve as historical notes of some of the most important events of the last twelve years. The subjects of two of the poems remind the readers that in the universal sorrow expressed throughout Great Britain and Ireland for the attempted assassination of General Garfield the British people only reciprocated the kind feelings of America displayed during the great illness of the Prince of Wales, and there are many others which are equally suggestive. The price has been fixed at 3s. 6d. to subscribers before publication; and, as Prof. Bradshaw's poems are invariably accurate in matter and metre, and pure in tone, without being of the exaggeratedly pious style sometimes met with, it is to be hoped that he will be able to say with his fellow-countryman, Moore, that "those hallowed forms are never forgot," and that he may profit by the remembrance of them.

THE COAL TRADE.

Mr. J. R. Scott, the Registrar of the London Coal Market, has published the following statistics of imports and exports of coals into and from the port and district of London, by sea, railway, and canal, during July, 1881:—

IMPORTS.			EXPORTS.		
By Sea.	Ships.	Tons.	By Railway and Canal.	Tons.	cwt.
Newcastle	129	113,671	London & North-Western	102,224	12
Sunderland	99	69,089	Great Northern	70,500	0
Seaham	33	17,275	Great Western	93,269	17
Hartlepool	43	16,712	Midland	155,205	0
Middlesbrough	4	2,076	Great Eastern	62,459	2
Scotch	11	6,145	South-Western	8,218	7
Welsh	29	26,660	South-Eastern	1,317	8
Yorkshire	27	2,597	Grand Junction Canal	452	0
Duff	1	352			
Small coal & cinders	10	6,107			
Colonial	2	133			
Total	388	265,927	Total	493,646	6
Imports—July, 1880	404	270,933	Imports—July, 1880	466,584	17

Comparative Statement, 1880 and 1881.			Comparative Statement, 1880 and 1881.		
By Sea.	Ships.	Tons.	By Railway and Canal.	Tons.	c.
Jan. 1 to July 31, 1881	2593	2,105,550	Jan. 1 to July 31, 1881	3,698,525	5
Jan. 1 to July 31, 1880	2990	2,051,715	Jan. 1 to July 31, 1880	3,475,518	14
Increase—1881	—	53,935	Increase—1881	223,006	11
Decrease—1881	—	97			

EXPORTS.			General Statement, 1880 and 1881.		
Railway-borne coal passing "in transitu" through district.	Tons.		Total distribution of coal from Jan. 1 to July 31, 1881		
Sea-borne coal exported to British Possessions, or to foreign parts, or to the coast	68,627		Total distribution of coal from Jan. 1 to July 31, 1880	1,376,974	
Ditto sent beyond limits by railway	20,065		Increase in the present year	154,737	
Ditto by canal and inland navigation	964	89,656	Increase in coals imported by railway	154,737	
Railway-borne coal exported to British Possessions, or to foreign parts, or to the coast	36,901		Increase in coals imported by sea	53,935	208,672
Ditto, by canal and inland navigation	107	37,008	Deduct increase in coals exported		154,737
Sea-borne coal brought into port and exported in same ships	145		Total increase in trade within the London district—1881	53,935	
Total quantity of coal conveyed beyond limits of coal duty district during July, 1881	210,147				
Ditto, during July, 1880	193,059				

We have been requested by Mr. J. V. Smedley to state that he resigned his seat on the board of the Wala-Wynad Indian Gold Mining Company (Limited) upon April 2.

ELECTRIC LIGHT.

The Compagnie Generale d'Electricite.

CAPITAL, 10,000,000 FRANCS.

The Compagnie is prepared to give estimates and supply the Apparatus for producing any number of lights for indoor and outdoor purposes on the

JOBLOCHKOFF SYSTEM,

such as used by the Metropolitan Board of Works on the Thames Embankment, London; the Municipality of Paris; the Belgium State Railways of Antwerp; the Harbour authorities of Havre; the Grand Hotel, Magasin du Louvre, Hippodrome, &c., Paris; and upwards of 4000 other places in England, France, Europe, India, &c.

The Compagnie Generale d'Electricite, who are the Proprietors of the Gramme Patent Dynamo-Electric Machine for alternating currents, are also prepared to give estimates and supply the apparatus for lighting by the Jamin system (such as used at the London Royal Panorama, Messrs. Samuel Bros., London, the Palais Royal, Paris, &c.), as also by means of other systems of which they hold the Patents.

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LONDON—1862.



CHILI—1875.



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EXHIBITION, 1881, for

"EXCELLENCE OF MANUFACTURE."

PA IS—1878.



MELBOURNE—1881





PARIS, 1867.
BRONZE MEDAL, 1867.



ORDER OF THE CROWN OF PRUSSIA.



FALMOUTH, 1867.
SILVER MEDAL, 1867.

A DIPLOMA—HIGHEST OF ALL AWARDS—given by the Geographical Congress, Paris, 1875—M. Favre, Contractor, having exhibited the McKean Drill alone as the MODEL BORING MACHINE for the ST. GOTHARD TUNNEL.

SILVER MEDAL of the Highland and West of Scotland Agricultural Society, 1875—HIGHEST AWARD.

At the south end of the St. Gothard Tunnel, where

THE MCKEAN ROCK DRILLS

Are exclusively used, the advance made during eight consecutive weeks, ending February 7, was 24-90, 27-60, 24-80, 26-10 28-30, 27-10, 28-40, 28-70 metres. Total advance of south heading during January was 121-30 metres, or 133 yards.

In a series of comparative trials made at the St. Gothard Tunnel, the McKean Rock Drill continued to work until the pressure was reduced to one-half atmosphere ($7\frac{1}{2}$ lbs.), showing almost the entire motive force to be available for the blow against the rock—a result of itself indicating many advantages.

The GREAT WESTERN RAILWAY has adopted these Machines for the SEVERN TUNNEL; the LONDON AND NORTH-WESTERN RAILWAY for the FESTINIOG TUNNEL; and the BRITISH GOVERNMENT for several Public Works. A considerable number of Mining Companies are now using them. Shafts and Galleries are driven at from three to six times the speed of hand labour, according to the size and number of machines employed, and with important saving in cost. The ratio of advantage over hand labour is greatest where the rock is hardest.

These Machines possess many advantages, which give them value unapproached by any other system of Boring Machine.

THE MCKEAN ROCK DRILL IS ATTAINING GENERAL USE THROUGHOUT THE WORLD FOR MINING, TUNNELLING, QUARRYING, AND SUB-MARINE BORING.

The MCKEAN ROCK DRILLS are the most powerful—the most portable—the most durable—the most compact—of the best mechanical devices. They contain the fewest parts—have no weak parts—act without shock upon any of the operating parts—work with a lower pressure than any other Rock Drill—may be worked at a higher pressure than any other—may be run with safety to FIFTEEN HUNDRED STROKES PER MINUTE—do not require a mechanic to work them—are the smallest, shortest, and lightest of all machines—will give the longest feed without change of tool—work with long or short stroke at pleasure of operator.

The SAME Machine may be used for sinking, drifting, or open work. Their working parts are best protected against accidents. The various methods of mounting them are the most efficient.

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11, Parade, Truro, 3rd February, 1881.

MAP OF CALLINGTON, CALSTOCK, AND TAVISTOCK MINING DISTRICTS.

Proposed to be published by subscription, a MAP of the ABOVE DISTRICTS, showing the names and boundaries of all existing sets, lodes, cross-courses, and every other matter which such a map should contain. Persons disposed to patronise the publication—at One Guinea per copy—will please send their names as early as possible to me. R. SYMONS, Mineral Surveyor, Truro, February 3rd 1881.

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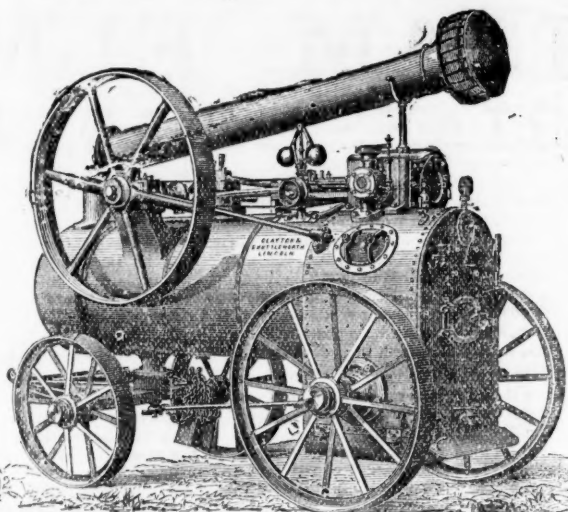
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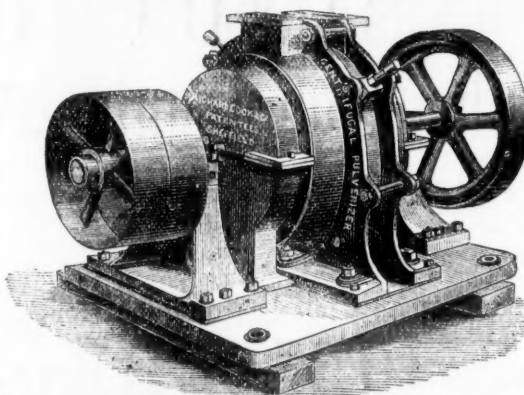
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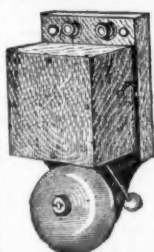
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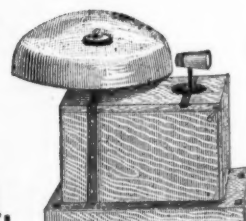
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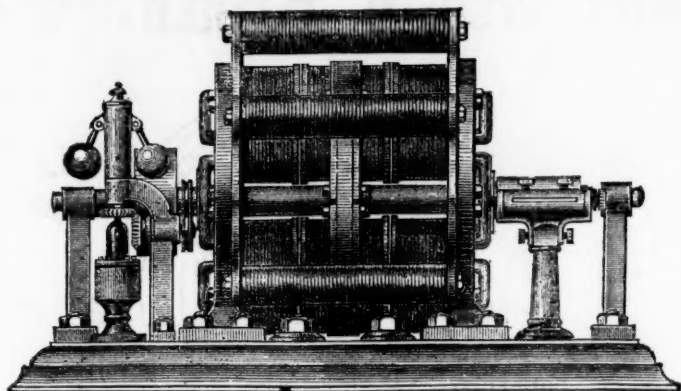


THE DYNAMO-ELECTRIC MACHINE SUPERSEDES EVERY KNOWN BATTERY.

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The "Elmore" Patent Dynamo-Electric Machine,

FOR DEPOSITING

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REPEATED COMPARATIVE TRIALS have proved that this is the MOST POWERFUL MACHINE IN THE MARKET, that it NEVER REVERSES CURRENT, and that it is very easily worked without special knowledge.

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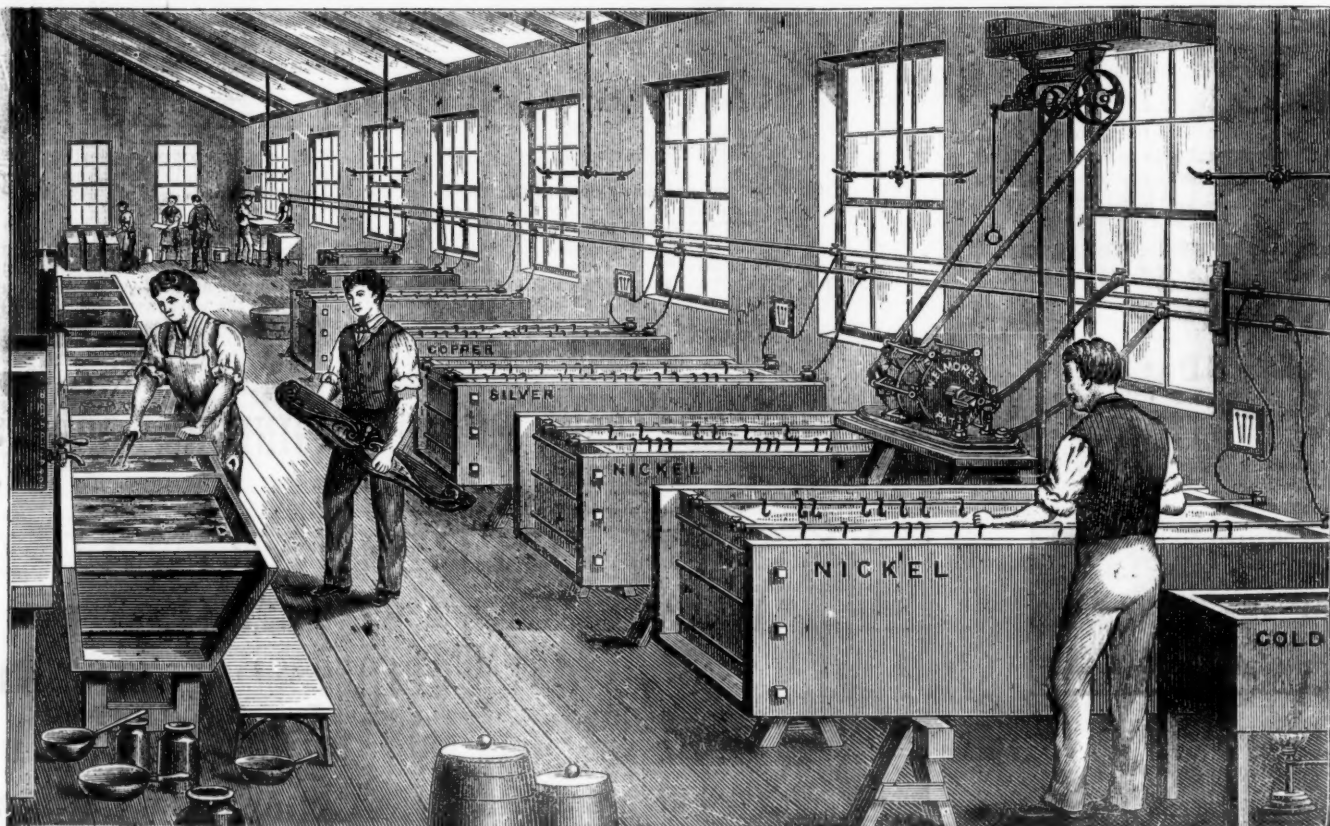
TO TIN-PLATE MANUFACTURERS AND GALVANIZERS.

The attention of TIN-PLATE MANUFACTURERS AND GALVANIZERS is respectfully directed to the NEW PROCESSES of manufacturing Tin-Plates by depositing the Metal by the current of an "ELMORE'S PATENT" DYNAMO-ELECTRIC MACHINE through aqueous solutions in contradistinction to the old processes of dipping in molten metal.

THE ELECTRO DEPOSITED METAL IS PERFECTLY REGULAR IN character, and the electric current may be so EASILY CONTROLLED as to coat with a MERE FILM OF METAL, OR A DEPOSIT OF ANY DESIRED THICKNESS. The great economy in the cost of plant and cost of production will be immediately self-evident. As nearly the whole of the existing plant can be used in the new process, the cost of altering the system will be comparatively trifling.

DYNAMO-ELECTRIC MACHINES

SPECIALLY CONSTRUCTED FOR DEPOSITING ANY METAL IN ANY QUANTITY.



The above represents an Electro-plating Works, in which an "ELMORE" PATENT DYNAMO-ELECTRIC MACHINE is being used for the deposition of Nickel, Silver, Copper, Bronze, Brass, Gold, Tin, Zinc, &c., from their Solutions.

From "INDUSTRY."

"By means of the dynamo-electric machine of Mr. William Elmore, the perfection of nickel-plating is obtained. Dynamo-electricity—that is, electricity produced by motive power—presents advantages which cannot be claimed by any galvanic battery known. Not only is the current produced at a far less cost, but it can be so regulated or controlled that the smallest article can be separately coated by a dynamo-electric machine, capable (in its full application) of depositing from 25 lbs. to 30 lbs. of silver per hour. It is a remarkable fact, moreover, that metals can be deposited from their solutions by dynamo-electricity in less than one-third of the time occupied by the ordinary battery in producing the same result. The quality of the deposit, in regard to its smoothness and regular character, is greatly in favour of dynamo-electricity.

"Having had considerable experience in dynamo-electric machines, Mr. W. Elmore has been careful to note the defects and irregularities which some of the less skilfully constructed machines have presented, and thus he has been enabled to produce a really practical and effective machine, of great power, which may be thoroughly depended upon as being capable of giving the most satisfactory results for all purposes of electro-deposition, including gilding, silvering, brassing, nickeling, and electrotyping.

"The advantages of dynamo-electricity in the important art of electrotyping are beyond estimation. When it is known that a fine, clear, deposit (or 'shell') of copper, 200 ft. square feet, can be obtained by a dynamo-machine in less than three hours, without 'pin-holes,' and other defects common to battery deposits, it will be at once seen that the ordinary battery is effectually and unmistakably superseded.

"One of the most useful purposes to which dynamo-electricity can be applied is the production of chemically pure nickel solutions, and salts of nickel, for the electro-deposition of the metal. The vast amount of elec-

tricity generated in a dynamo-machine enables one to dissolve nickel and other metals in their own solvents, far more economically, and in greater purity than by the ordinary method of treating metals. Electrical power obtained by the ordinary galvanic battery would be far too expensive for this purpose. The solutions formed by the aid of dynamo-electricity are not only purely and economically made; but they can be produced in less time, and with comparatively little trouble and attention. To Mr. Elmore is due the honour of having introduced into this country the process of making pure nickel solutions and salts by means of dynamo-electricity. The boon he has thus conferred upon a large industrial class we need not dilate upon."

From "THE IRONMONGER."

"A still further improvement in the deposition of metals has been recently obtained by the introduction of the dynamo-electric machine of Mr. Wm. Elmore, which is in reality electricity produced by motive power. By this means the current is obtained at a much less cost, and I have seen it regulated to such a nicety that the smallest article could be separately coated in a full-sized vat. The deposit is also effected in about one-third of the time taken by a galvanic battery, and for smoothness and regularity of surface is greatly in favour of the dynamo process, which may be known from the fact that all Mr. Elmore's competitors, both in London and elsewhere, are fast adopting his machine in preference to the old process. He has, in addition, supplied it to many large firms throughout the country for electrotyping purposes, and the reports received from them are gratifying to the inventor. Mr. Elmore is also the author of an interesting little work on the subject, which may be read with interest by those who contemplate entering into what is fast becoming an important industry."

WILLIAM ELMORE, 91, BLACKFRIARS ROAD, LONDON, S.E.

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DYNAMO-ELECTRIC MACHINES SPECIALLY CONSTRUCTED FOR DECOMPOSITION.

DYNAMO-ELECTRIC MACHINES FOR DEPOSITING ANY METAL IN ANY QUANTITY.

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Gold Medal, Silver Medal, and Honourable Mention awarded at the Paris Exhibition, in competition with all the World,
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OF CORNWALL.

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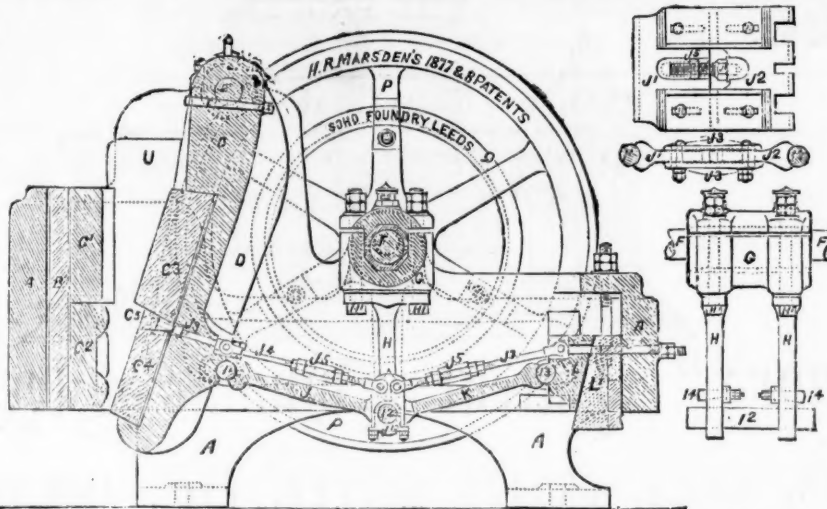
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H. R. Marsden, Esq.,
Soho Foundry, Meadow-lane, Leeds.

St. John del Rey Mining Company (Limited).
A SAVING OF FIFTY-FIVE HANDS BY THE USE OF ONE MEDIUM-SIZED MACHINE.

BLAKE'S STONE BREAKER.—Statement made by the Managing Director of the St. John del Rey Mining Company, Mr. John Hockin, with regard to six months' practical working of Blake's Stone Breaker, affording facility for judging of the relative economy of machine and hand labour in this kind of work, and also of the cost of getting the Stone Breaker to work in difficult places. The price paid to Mr. Marsden for the machine referred to by Mr. Hockin was £180, and adding to this the cost of engine carriage, and fixing, the aggregate cost to the company of the Breaker in working order was £500. By this outlay the company is enabled to dispense with the labour of 55 people, the value of which is £800 per annum. The cost of working the machine could not be more than the wages of about five men (the machine requires but one man to feed it, so that the rest would be for engineer, fuel, oil, &c.), and allowing for interest on outlay and for renewal when necessary, the saving must be enormous.—Mining Journal.

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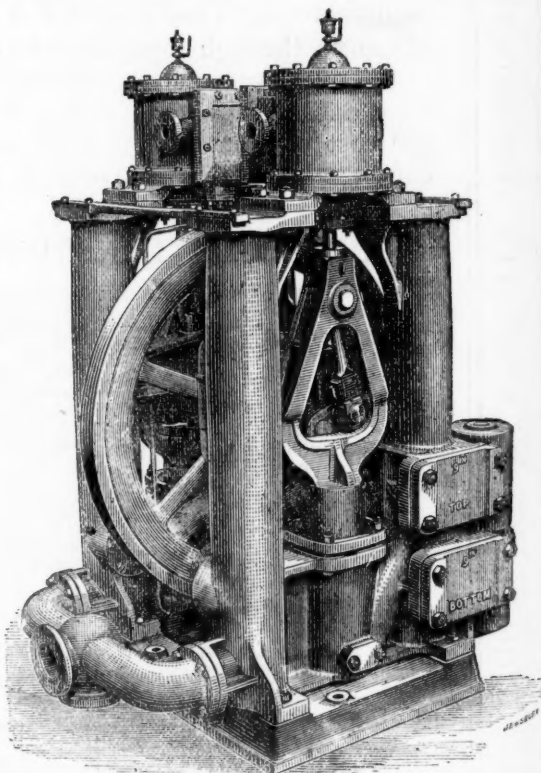
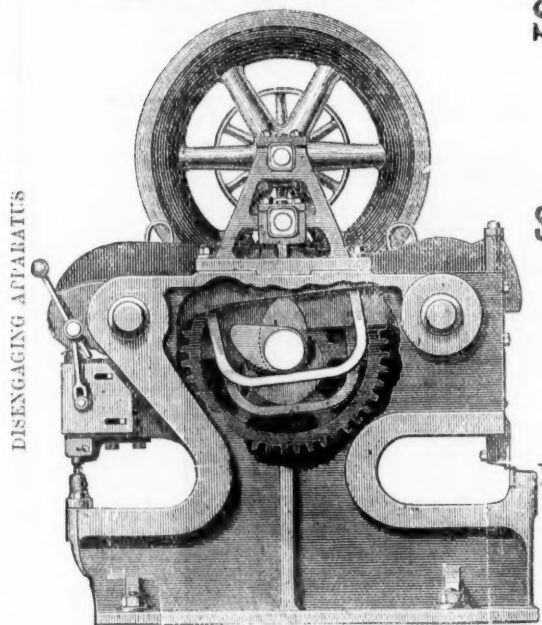
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